

January 1936

TECHNOLOGY

REVIEW

Title Reg. in U. S. Pat. Office



technology review

Published by MIT

This PDF is for your personal, non-commercial use only.
Distribution and use of this material are governed by copyright law.
For non-personal use, or to order multiple copies please email
permissions@technologyreview.com.



Chesterfields . . .

*a corking good cigarette . . .
they've been hitting the trail
with me for a long time*

They are milder . . . not flat
or insipid but with a pleas-
ing flavor

They have plenty of taste
. . . not strong but just right

*An outstanding cigarette
. . . no doubt about it*

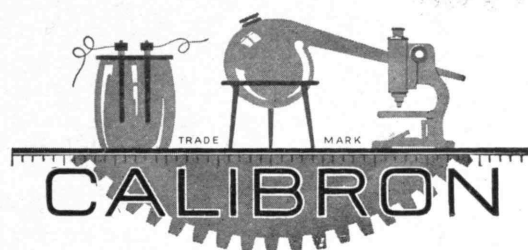
© 1936, LIGGETT & MYERS TOBACCO CO.

THE TABULAR VIEW

A HIGHWAY shall be there!" is a slogan of growing power to activate peoples of all parts of the world. The Review presents, on page 138, a comprehensive survey of new lines on the road map of the world, prepared by our Editorial Associate, JOHN ELY BURCHARD, '23. Mr. Burchard is Vice-President of the Housing Company and is well known as an authority in the field of housing. ¶ The discussion, beginning on page 141, of the training of public health administrators is a topic of vital importance not only to workers in this field but to the public at large. Its author, MURRAY P. HORWOOD, '16, is Associate Professor of Biology and Public Health at Technology. Professor Horwood has directed many public health surveys and is the author of a recent book, "The Sanitation of Water Supplies." ¶ A. B. KINZEL, '21, is chief metallurgist of the Union Carbide and Carbon Research Laboratories. ¶ Contributors to the "Trend of Affairs" section of this issue include AVERY A. ASHDOWN, '24, Assistant Professor of Chemistry at Technology, and FREDERICK G. FASSETT, JR., Assistant Professor of English.

ONE of the questions most frequently asked of the Review Editors is: "Where do you obtain the handsome photographs which are reproduced in The Review?" The answer is literally from all over the world. Our readers send us pictures and tell us about others; both amateur and professional photographers forward to us many prints on approval (during the week before this was written, approximately 100 photographs passed across the Editor's desk, and in selecting the 33 prints in this issue, some 200 were examined); The Review Staff watches photographic exhibitions for appropriate subjects. Many of our most novel and interesting illustrations come from amateurs, and it is in this direction that we look in the future for new material. We solicit suggestions and prints from our readers, feeling that among them are others of the high caliber of W. C. West, '11, the new President of the Chicago Camera Club, Alexander J. Krupy, '24, medalist in salons at home and abroad, Frederick B. Wolf, '28, who has shown us unexpected beauties in Mexico, Alexander Piaget, who has joined Mr. Wolf in his photographic expeditions to Mexico and who has recently, in these pages, given us striking pictures of industrial St. Louis, and of scores of other gifted amateurs whose work has appeared in The Review.

UPON entering 1936, we again salute our family of readers (it is larger by 1,000 than a year ago) and wish them a year fruitful in accomplishment and crowded with pleasures and satisfactions. A magazine is measured by its readers—their responsiveness, discrimination, and interest—and by this rule The Review carries a flag of distinction proudly. To our subscribers, therefore, as we acknowledged a year ago, belongs the final credit for The Review. Its contents have been inspired and improved (*Concluded on page 126*)



The first issue of the

CALIBRON NOTEBOOK

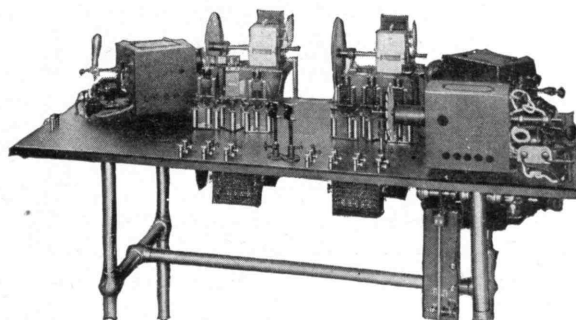
contains a description of our unusual Guaranteed Research service; the second is a report on one of our engineering developments. We shall be glad to send you copies on request.

CALIBRON PRODUCTS, INC.

West Orange, New Jersey

CAMBRIDGE INSTRUMENTS

for A-C Measurements



12 Element Oscillograph

Cambridge furnishes a wide range of instruments for high and low frequency measurements for use in standardizing, research and commercial testing laboratories. Literature describing a wide range of instruments suitable for precise measurements of alternating current, voltage and power, will be sent upon request. Instruments will be constructed to meet special requirements. Send for list T 118.

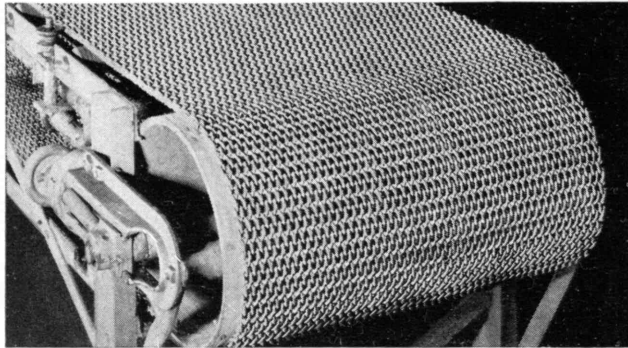
OTHER CAMBRIDGE PRODUCTS:

Moisture Indicators and Recorders	Physical Testing Instruments
Surface Pyrometers	Laboratory Insts. for A.C. & D.C.
Galvanometers	Engineering Instruments
Gas Analysis Equipment	Physiological Instruments
and other Mechanical and Electrical Instruments.	

CAMBRIDGE
INSTRUMENT CO INC

Pioneer Manufacturers of Precision Instruments

3732 Grand Central Terminal, New York



Designed for your requirements

Wissco Balanced Spiral (Reg. U. S. Patent Office) Conveyor Belts do give satisfaction because each and every belt is made especially for the job it must do. Selection of metal, size of wires, and mesh are all carefully considered. A questionnaire is included in each of the new Conveyor Belt Hand Books to facilitate the giving of necessary data. The Wissco policy is to quote only after study of the problem and to produce a belt *designed for your requirements*

WICKWIRE SPENCER STEEL CO.

41 East 42nd Street, New York City
BUFFALO WORCESTER CHICAGO

Pacific Coast Headquarters: San Francisco
Warehouses: Los Angeles, Portland, Seattle
Export Sales Department: New York City



WICKWIRE SPENCER STEEL CO.
41 East 42nd Street, New York City

I would be pleased to receive one of your new Handbooks on Metal Conveyor Belts.

Name

Company

Address

City State TR

THE TABULAR VIEW

(Concluded from page 125)

by their understanding and appreciation; their discrimination and interest have drawn to these pages not only able contributors but quality advertisers who have found, because they merited it, ready and profitable response.


ON the assembly side, a magazine is the product of many hands, and The Review is no exception. Of the many photographers whose pictures lend distinction to these pages we have spoken above; the contributors have their *bona fides* recorded in this column each month; our Editorial Associates are known to you. The Publisher, Editor, and Business Manager present their homage to all of these groups and to another, which we wish our readers to know better — the Review Staff, the roster of which we take pleasure in calling. ¶ Miss Madeline McCormick, mistress of the counting room, authority on Technology alumni affairs. She walks undismayed through the most confusing by-ways of accounting. ¶ Miss Ruth King, curator of advertising, the right hand of the Business Manager. Her typing is a delight, and no part of publishing is beyond her competence. ¶ Miss Irene Lavin, in charge of circulation files, expert in the mysteries of mailing and of circulation statistics. Her wit withstands even a spilled tray of stencils or an unexpected flood of address changes. ¶ Miss Marjorie Fuller, in charge of class and club notes, corrector to the press. The dictionary is her favorite novel, and she delights in the perplexities of manuscript preparation and the arduous chase of elusive facts. ¶ Miss Sylvia Francis, newcomer, who joins Misses King and Fuller in their work and who aspires to their skill in the arts of correspondence, filing, indexing, and preparing manuscript for the press. ¶ To the expertness and loyalty of these various members of the Review Staff it is a pleasure to bear witness.

MAIL RETURNS

From TREADWELL CLEVELAND:

Dr. Lydiard H. W. Horton's article in the December Review (p. 97) must have been interesting to many of your readers, I feel sure. "Historical lag," to use Dr. Horton's own term, does hold back psychology, no doubt, and little wonder. Historical lag is holding back other departments of science, too. It is only in recent years that the extent and importance of this general sluggard's pace in the sciences has been brought to light by the critical efforts of philosophy, the interpreter and organizer of intellectual efforts in all fields.

It was only yesterday that biological evolution began to free itself from the concept of mechanical determinism as taught by the Neo-Darwinians, who construed the process as one of random variations plus environmental selection; that psychology (save for the Die-Hards in America of the extreme Behavioristic school) discarded the old sensationalism and associationism that was part of the same mechanistic dogma; that even mathematical prediction freed itself from the bonds of hard-and-fast determinism and took its stand instead on the ground of statistical probability; that the body-mind (Concluded on page 159)



MOLY

on its merits

WHEN a user wishes steel for any particular application, he considers the physical properties which the steel must have. He usually has a choice of several steels. The consideration then quite logically narrows down to the *most economical* steel with which to meet the requirements.

For practically every known application, a Molybdenum-containing steel is available which is more economical than any other type of alloy steel. A broad claim? Yes. But a claim that is based, not on laboratory tests alone, not on isolated instances of practice — but invariably on repeated proofs in manufacture and in service . . . *on the merits* and general recognition of Molybdenum's outstanding qualities.

With "Moly" having, in the past few years, so broadly affected costs and service standards, it is a wise move of the manufacturer of alloy-steel products

or the user of alloy-steel equipment and tools, to review his requirements; to consult the Climax engineers; and to learn for himself how money can be saved by standardizing on the more economical Molybdenum-containing steel having physical properties at least equal to what he is now using.

Continual Molybdenum developments have led to the publication of our house organ, "*The Moly Matrix*." A word from you puts you on our mailing list. A further request brings you these interesting books: "*Molybdenum in 1934*" and "*Molybdenum in Cast Iron — 1934 Supplement*." And for any alloy problem peculiar to your business, the services of our metallurgists and Detroit experimental laboratory are open to you. Climax Molybdenum Company, 500 Fifth Avenue, New York City. (In Canada: Railway & Power Engineering Corp., Ltd.)

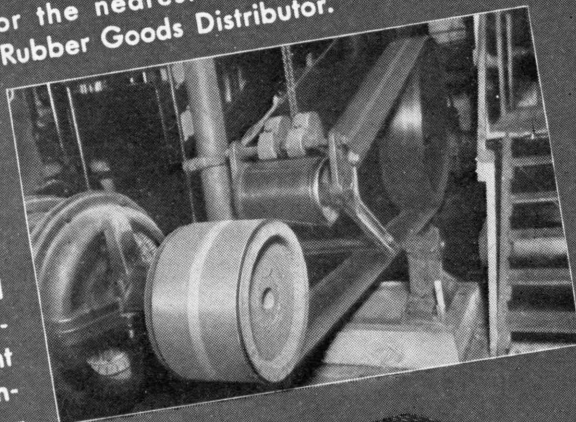
CLIMAX Mo-lyb-den-um

THE LONGEST-WEARING BELT EVER BUILT

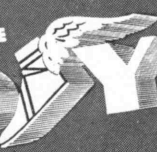
PROOF—here pictured is a Goodyear COMPASS (Cord) Belt after 4 years' continuous service on the 85 h. p. drive of a variable speed paper machine in an Indiana straw board mill. No other belt ever gave over 18 months' service on this drive! Many failed in two to three months! More than two times longer service than the best—that's typical COMPASS performance on countless belt-killing drives!

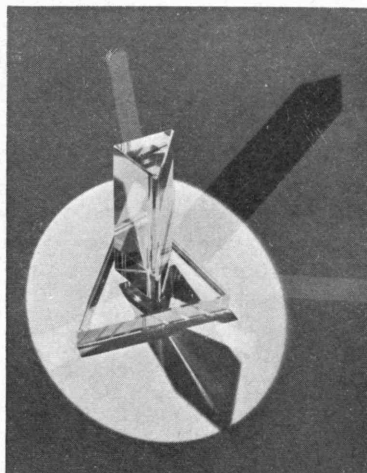
REASON—the Goodyear COMPASS Belt is the modern version of the time-proved rope drive. Within a tough protective rubberized fabric envelope, the load is carried by a layer of heavy rope-cord spiralled continuously without a splice—the weak joint in other belts! A patented Goodyear construction, it is the only truly endless belt—

and the most nearly stretchless. The G.T.M.—Goodyear Technical Man—will gladly consult with your engineers in selecting the proper type COMPASS for your hardest drives. Just write Goodyear, Akron, Ohio, or Los Angeles, California—or the nearest Goodyear Mechanical Rubber Goods Distributor.



**BELTS
MOLDED GOODS
HOSE
PACKING**
MADE BY THE MAKERS OF
GOODYEAR TIRES

THE GREATEST NAME  IN RUBBER
GOOD YEAR



Korth

THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 38, NO. 4

CONTENTS

JANUARY, 1936

THE COVER

From a photograph by Gerald Young

WE LOOK INSIDE	FRONTISPIECE	130
HIGHWAYS ON THE MARCH	By JOHN ELY BURCHARD	138
<i>New Lines on the Road Map of the World</i>		
TRAINING FOR PUBLIC HEALTH ADMINISTRATION	By MURRAY P. HORWOOD	141
<i>Is a Medical Degree a Primary Prerequisite?</i>		
THE FUTURE OF ALLOY STEELS	By A. B. KINZEL	144
<i>How Important Will They Be in 1944?</i>		

THE TABULAR VIEW		125
<i>Notes on Contributors and Contributions</i>		
MAIL RETURNS		126
THE TREND OF AFFAIRS		131
<i>News of Science and Engineering</i>		
THE INSTITUTE GAZETTE		147
<i>Relating to the Massachusetts Institute of Technology</i>		

Editor
J. RHYNE KILLIAN, JR.

TENNEY L. DAVIS

Publisher
HAROLD E. LOBDELL

Editorial Associates
JOHN J. ROWLANDS

Business Manager
RALPH T. JOPE

JOHN ELY BURCHARD

PUBLISHED MONTHLY FROM OCTOBER TO MAY INCLUSIVE AND IN JULY ON THE TWENTY-SEVENTH OF THE MONTH PRECEDING THE DATE OF ISSUE AT 50 CENTS A COPY. ANNUAL SUBSCRIPTION \$3.50; CANADIAN AND FOREIGN SUBSCRIPTION \$4.00. PUBLISHED FOR THE ALUMNI ASSOCIATION OF THE M. I. T. EDWARD L. MORELAND, PRESIDENT; MARSHALL B. DALTON, C. A. SAWYER, JR., VICE-PRESIDENTS; CHARLES E. LOCKE, SECRETARY; J. RHYNE KILLIAN, JR., TREASURER.

PUBLISHED AT THE RUMFORD PRESS, 10 FERRY STREET, CONCORD, N. H. EDITORIAL OFFICE, ROOM 11-203, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE A. MASS. ENTERED AS SECOND-CLASS MAIL MATTER AT THE POST OFFICE AT CONCORD, N. H. COPYRIGHT, 1936, BY THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. THREE WEEKS MUST BE ALLOWED TO EFFECT CHANGES OF ADDRESS. BOTH OLD AND NEW ADDRESSES SHOULD BE GIVEN.

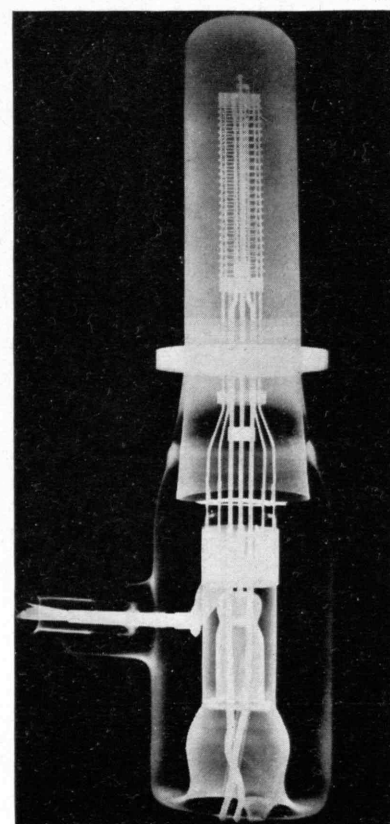
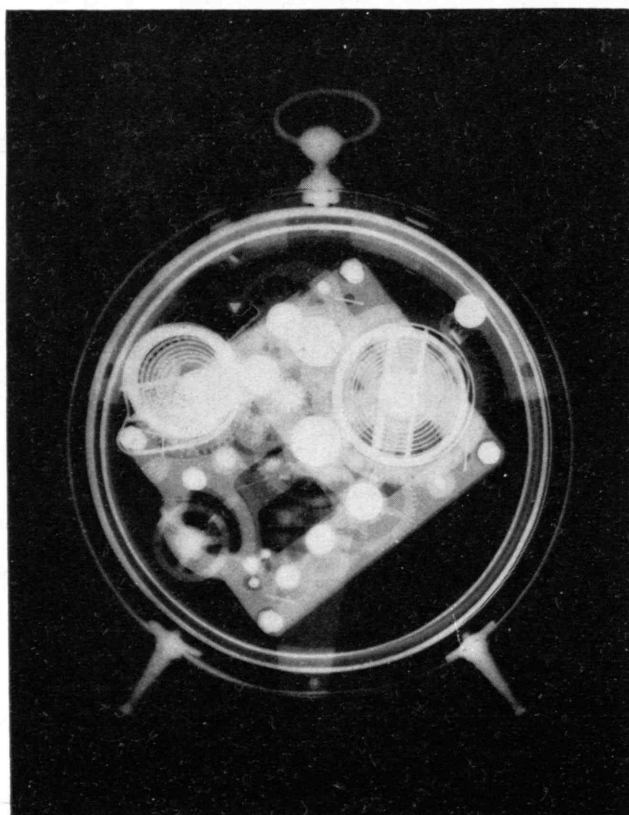


General Electric X-Ray Corp.

We Look Inside

Radiographic portraits of a snake (which had just devoured a fowl), a 0.45 calibre automatic pistol, an alarm clock, and a radio transmitting tube.

Since its discovery in 1895, the x-ray has become an enormously important tool in science, medicine, and industry. As a supermicroscope, the x-ray shows the internal arrangement of crystals, makes possible the determination of the architectural plan of matter—the patterns of atoms and molecules in space. Radiographic examination of cast metals and welds, by detecting blowholes, inclusions, and cracks, has resulted in greater safety and improved metallurgical processes.



THE TECHNOLOGY REVIEW

Vol. 38, No. 4



January, 1936

The Trend of Affairs

The following report, we are happy to note, deals with the work of a member of the M.I.T. Corporation and was prepared by President Karl T. Compton who attended the conference at which the results outlined below were disclosed. — THE EDITOR

Electric Brain Waves

MORE than 50 of the country's leading medical men, biophysicists, and biochemists, were the guests of Mr. Alfred L. Loomis on November 10 for a conference on one of the most fascinating of the newer discoveries of science in relation to life processes — waves of electrical voltage which are detectable in and near the brain and which are markedly influenced by mental processes. The conference was held in a palatial residence in Tuxedo Park, N. Y., now transformed by Mr. Loomis into one of the finest small laboratories of the world — the Loomis Institute for Scientific Research.*

Although differences of electrical potential between parts of the brain, under circumstances such as injury, were discovered as early as 1875, recent activity in this field dates from about 1929 and has been made

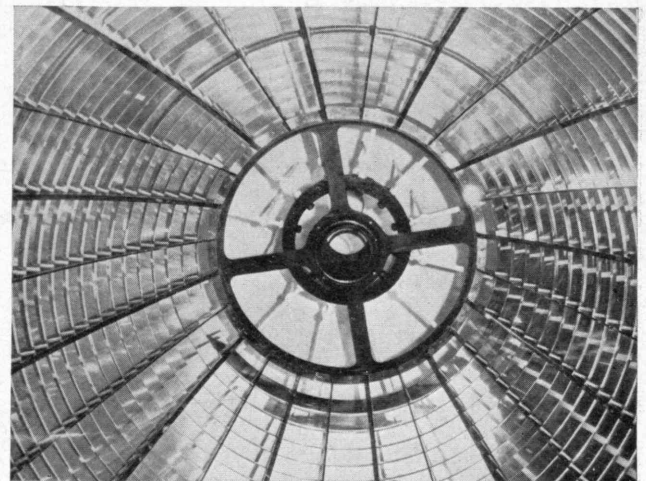
possible largely by the development of new electronic apparatus — vacuum tube amplifiers and oscillographs. It is only of late that experiments have been made on human beings and under conditions in which the correlation of electrical activity and mental state can be studied.

In the work at the Loomis laboratories, the subject undergoes no particular hardship. A moist cloth band, placed around his head just above the ears, forms one electrode and the other is a small metal plate placed against the skull (after shaving a small, clear spot) and held in contact with adhesive tape. These electrodes pick up whatever electric potential differences occur between these parts of the skull and feed them into an amplifier, whence they are recorded by an oscillograph or chronograph which can print a continuous record for 10 hours, if desired. Usually the subject lies in a bed fitted with devices for simultaneously recording his movements, together with pulse and respiratory rates. Sounds, lights, or directions can be conveyed to him, as desired.

Normal persons, in a state of mental relaxation and with eyes closed, but not asleep, give predominantly a potential difference of the order of 10 microvolts, alternating in direction at the rate of 10 cycles per second. If the subject is made mentally active by being asked to perform mental numerical computations or especially by looking at any object, these 10-cycle waves disappear and are replaced by a very irregular electric disturbance of much smaller voltage. The response to these changes, as eyes are opened or closed or as light is flashed on or off, is not instantaneous, but occurs a considerable fraction of a second after the change.

If the subject falls asleep, the 10-cycle waves disappear and there is only an occasional, small, irregular electric disturbance. Once in a while, however, a large

* Opened in 1926 and operated by Mr. Loomis and invited guest scientists, this laboratory has already made a notable record of achievement. In it Loomis and Wood investigated the nature and effects of supersonic mechanical vibrations, and Wood and Kistiakowsky have conducted important spectroscopic studies. Loomis has made the most accurate investigation ever conducted into the accuracy of clocks and of wireless time signals from Arlington, Greenwich, and Eiffel Tower, from which there have been discovered tides in the solid earth and a periodic small widening and narrowing of the Atlantic Ocean. Loomis and Harvey invented a centrifugal microscope and a new form of chronograph for making a continuous long record of variations in periodic processes like pulse or respiratory rates. Recently attention is being concentrated on development of new physical apparatus for the study of vital processes in animals and plants.



Fairbanks

Light on Makapuu Head, near Honolulu. It contains, as shown in these interior and exterior views, one of the world's largest lighthouse lenses. With 1,140 separate prisms of highly polished glass, the lens is 9 feet in diameter and 13 feet high

regular disturbance appears and lasts for a second or two. Peculiarly, these have a characteristic frequency of about 14 cycles per second, instead of 10. There is some suggestion that periods of electrical activity in sleep are associated with dreams.

Epileptics give very different results. Their natural rhythm is slow and of large amplitude. For as much as 15 seconds before a seizure occurs, the voltages show marked progressive changes which settle down into characteristic patterns during the seizure. In mild seizures (*petit mal*) the voltage pattern is three cycles per second of large but slow voltage variations, alternating with very sudden voltage jumps. In severe seizures (*grand mal*) the pattern is exceedingly violent and irregular, but the voltages almost completely vanish during the subsequent period of stupor.

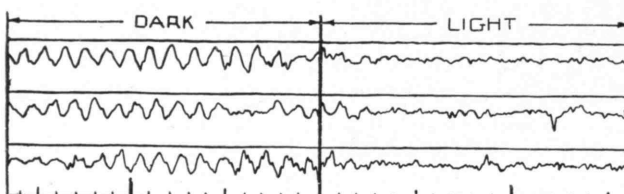
Similar interesting results have been obtained from men under hypnosis, blind from birth, or under the influence of various drugs. In the latter case, frequencies may occur up to well over 100 cycles. Under certain conditions the normal 10-cycle waves can be temporarily changed and brought into step with a periodically flickering light flashing in the eyes, though there is a marked tendency suddenly to slip back into the 10-cycle type.

All of these phenomena are most puzzling, but so interesting as to suggest the possibility of extremely impor-

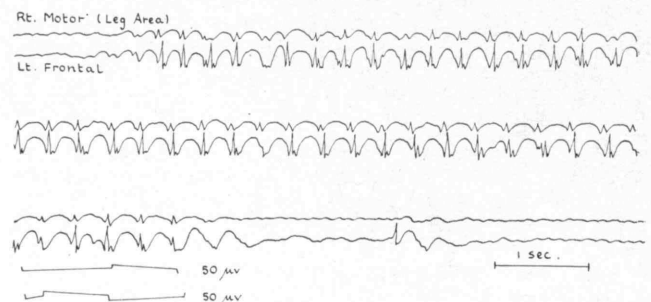
tant interpretations. As seismic waves reveal conditions in the interior of the earth, these external electric waves undoubtedly signify events in the interior of the brain. What are they? Unfortunately, as in the case of seismic waves, we measure on the surface only the averaged effect of what may be a number of separate disturbances. By moving the electrodes to various places on the skull, some information is gained as to which parts of the brain are predominantly active. By inserting needle electrodes into the brains of animals it is actually found that different brain territories behave electrically with marked differences. It is believed that the potentials in the brain itself may be 100 or 1,000 times greater than those detected on the outside of the skull.

New Barometer of Health

WHILE Mr. Loomis and his associates study electrical currents related to mental processes, a great hospital in Boston is obtaining equally fascinating results by measuring, with equipment designed at Technology, other electrical properties of living tissue.



Three samples of records of brain potentials. Read from left to right. Time scale in tenths of a second at bottom. In each case subject with eyes opened was lying in a completely darkened room. At point on record indicated by the center line a dim light was flashed on. Note the regular rhythm (ten per second) when in the dark and how this rhythm stops within a tenth of a second when light appears. (From the laboratory of Mr. Alfred Loomis)



Oscillograph record (Davis and Gibbs) of a *petit mal* epileptic seizure which is quite typical. At the Harvard Medical School, Drs. Hallowell Davis and Frederic A. Gibbs, both of whom participated in the Loomis conference, are using two-channel recording; the upper record shown above was made with the grid lead on the right motor region (leg area), the lower with the grid on the left frontal regions. The lobes of the ears are connected together and used as a common ground

J. Warren Horton of the Institute's Department of Electrical Engineering has recently designed and built an instrument, the function of which is to measure quantitatively the manner in which living tissue conducts an electric current. This property is known as "electrical impedance," and the instrument is called an "impedance comparator." Working in conjunction with Dr. A. C. VanRavenswaay of the metabolism laboratory of the Massachusetts General Hospital in Boston, this new device has been used in a statistical study of a large number of pathological cases. As a result of their research, both Mr. Horton and the collaborating medical workers believe that certain electrical constants may be used as barometers of pathological conditions, just as blood count, heart rate, and body temperature can indicate deviations from normal health.

The Horton comparator possesses a distinct advantage over previously designed instruments devised to determine body impedance, since it is capable of measuring the impedance of internal tissue independent of the effects of the outer sheath, which is subject to wide variations. A portable form of this apparatus has been constructed and may be wheeled directly to the bedside of patients in hospital wards. Narrow electrodes, constructed of phosphor-bronze screening and covered with outing flannel are fastened to the arms of the subject, one electrode on each upper arm and one on each wrist, forming a four-terminal electrical network. Dial readings of the instrument then indicate the value of internal impedance of the body. As with the Loomis brain wave tests, patients experience no discomfort while such measurements are being taken. In fact, there is no sensation of any kind.

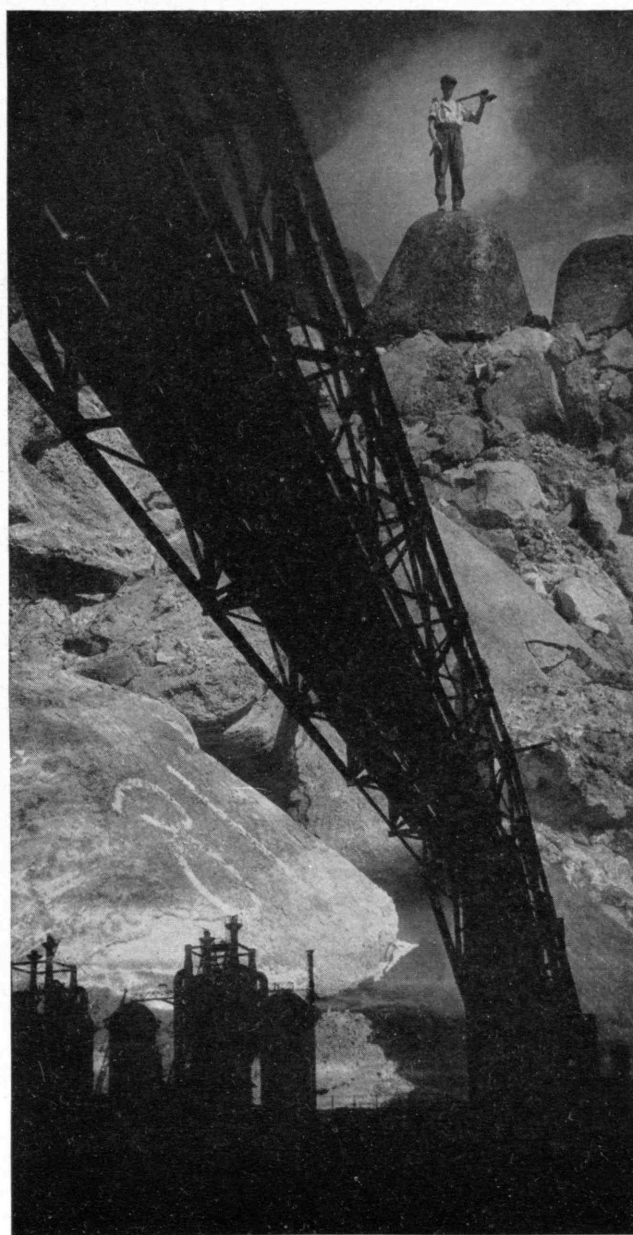
Research by other investigators in this field has indicated the possible use of body impedance values in the clinical diagnosis of thyroid disease. Preliminary tests by Horton and VanRavenswaay, in an effort to check reported correlations between what is known as "impedance angle" and thyroid condition, show that impedance of the human body does not appear to offer a direct indicator for thyroid disturbances, although some interesting trends have been observed. In particular, one impedance factor, designated by the symbol "Q," has been found to possess diagnostic significance. In the examination of more than 100 patients a high value of this impedance factor has invariably been associated with cases of deficient thyroid activity. It has also appeared that observed changes in the values of this factor are associated with variations in the physical make-up of the body as a result of nutritional disturbances.

Further evidence supports the hypothesis that there is a characteristic value of the impedance constant for a person in normal good health, and that this value is characteristic of the individual, just as is eye color. Observations at the Massachusetts General Hospital of a group of about 100 doctors and nurses in good health indicated that the characteristic value of this constant for persons in normal health lies between 60 and 80 (for convenience the values shown are 1,000 times Q). In contrast, the extreme limits that have been found in pathological cases are 20 and 140. This fact is extremely interesting from a medical standpoint, since most physical constants used in diagnostic technique shuttle to

and fro between narrow limits. With the impedance constant of the body varying as much as 600% in pathological cases, diagnosticians see exciting prospects for this new barometer of health.

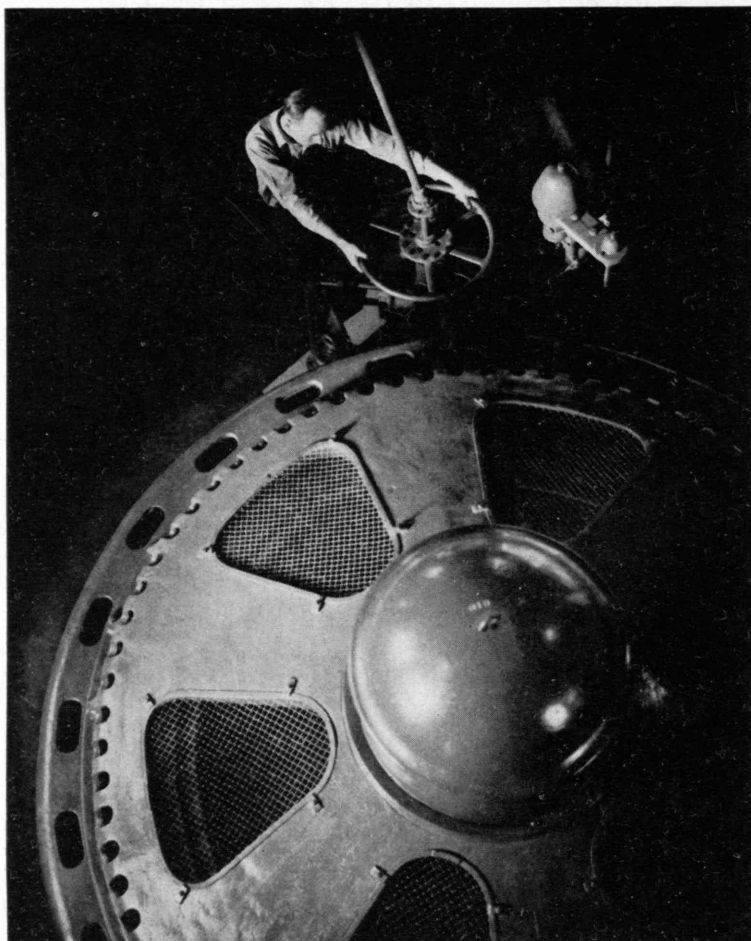
Inulin

IN the course of their growing seasons, plants store up reserve food supplies to be used in such periods of their life cycles as the early stage of the development of seedlings. To this end it appears that the carbohydrate, starch, is deposited in the kernels of corn, in the tubers of the potato, or in the seeds of plants generally. A similar, but different carbohydrate, called inulin (not to be confused with insulin, the boon to sufferers from diabetes) is stored by that order of the flora called the *Compositae*, comprising the sunflower, the dandelion, the artichoke, the dahlia, and other equally well-known plants.



F. S. Lincoln, '22

Slag pile. Montage from pictures made at an English steel plant



Turbine in hydroelectric plant

Young

Several years ago, chemists of the Bureau of Standards in Washington announced a process for obtaining sugar, known technically as fructose or levulose, from the Jerusalem artichoke. Now it appears that the dahlia may rival this earlier source in importance; recently new ways were announced for successfully obtaining from dahlias this substance, inulin (which may constitute as much as 42% of the dried tuber), a sugar twice as sweet as ordinary cane sugar.

A trial field for growing dahlia tubers is in operation in California and reliable estimates show that these plants, properly cultivated, can yield about the same tonnage of roots to the acre as do sugar beets. Furthermore, in at least one of the new methods for processing, inulin, while still remaining within the tubers, is converted into fructose which can be leached in a manner similar to that employed for beet sugar. Observers have pointed out the possibility of manufacturing fructose in factories already existing for the production of beet sugar, thus helping to tide over the idle period of that industry. No doubt many technical problems will arise before fructose becomes a widely used commodity. But since it appears to be tolerated in the metabolism of diabetics and its great sweetness recommends it as an article of food for all who crave sugar but should decrease the carbohydrate content of their diet, its parent compound, inulin, will likely come to play a definite rôle in the food supply of mankind.

For purposes of a clearer understanding, inulin may be compared with starch, which it resembles outwardly as a nearly snow-white powder, but from which it differs in that it can be obtained in the form of small, doubly refracting spherocrystals. Like starch, inulin is virtually insoluble in cold water but hot water dissolves considerable quantities of it, forming clear, nonopalescent solutions. Under similar conditions, starch yields a jelly, familiar in such articles of diet as the cornstarch pudding. When mixed with a little iodine (in the form of a tincture), solutions of inulin show no change in color, whereas starch, so treated, gives its well-known, characteristic, deep-blue color test. If starch is boiled with slightly acidulated water, it undergoes the chemical change called hydrolysis and thereby is converted into dextrose (glucose), known to chemists as an aldehyde sugar. Inulin, on the other hand, treated similarly, yields fructose (levulose), a different compound and known as ketone sugar.

Far from being a newly discovered compound, inulin was first isolated by the chemist Rose in 1804. In the 132 years which have elapsed since that day, a knowledge of its profitable sources and of its properties has been accumulating slowly, until the time has arrived when inulin appears to be assuming some commercial importance and taking a place as a source of food.

Preserving with Cellophane

A VISITOR to the grocery store who sees the attractive packages of dates, salted nuts, candies, pastry, and even glass jars of preserves, all wrapped in golden-yellow transparent cellophane, and judges that they are wrapped in this fashion in order that they may be more pleasing to the eye and of greater sales appeal, has guessed only part of the story—the less important part. The wrappings are the result of extensive experiments on the effect of light on foodstuffs. They are designed as protection from the action of the ultraviolet light which makes food turn rancid.

Experiments were carried out for the purpose of studying the effect of sunlight, of sunlight lamps, and of light of various colors. The colors were found to be of little importance except to the extent that they absorbed blue light. It is ultraviolet light which does the damage.

One sample of potato chips showed signs of rancidity after an exposure of two hours to sunlight in a colorless bag and after six hours of similar exposure to the light of a sun lamp, but remained for 20 times as long, that is, for 40 hours in sunlight and for 120 hours in the light of a sun lamp, before becoming rancid. Fudge turned rancid after five hours in the sunlight in a colorless bag and after 100 hours in sunlight in a wrapper of yellow cellophane. Coconut macaroons, crullers, butter, lard, and many other foodstuffs kept sweet about 20 times as long when protected by the new wrappers.

The golden-yellow cellophane really accomplishes what we have heard claimed for cosmetics: it beautifies, protects, and preserves. And well-preserved food, at least, is a desirable thing. The cellophane, moreover, keeps sweet the thing that it beautifies.

Speculation in Futures

IN the United States of 1960, according to recent preliminary predictions by the Administration's National Resources Committee, the population will contain twice as many people over 60 years of age as it does at the present time; the influence of youth, consequently, will be much less than it is today, or has been in recent years. The probable social changes implicit in this situation offer basis for speculation in futures not by theorists only, but by anyone who expects to be doing business in the country a short 25 years hence.

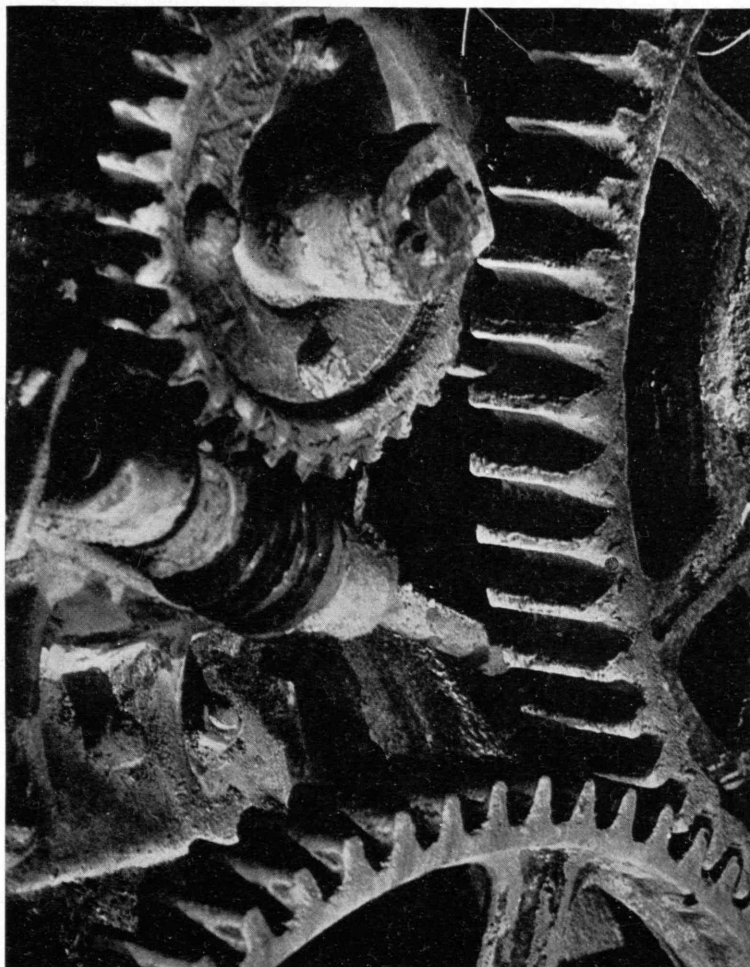
The question readily rises of how the oldsters of 1960 will secure their livelihood. If the nation's retired list is to be so much larger, current concern over security and pension plans for old age will inevitably be magnified. Partial explanation of enthusiasm for the Townsend plan, for instance, is to be found in the prevalence of urban dwelling; there is no longer, for many people, the family farm on which the old couple might live out their time, retainers of the son who had "heired" the place while his brothers migrated to the city. Though it may be argued that current utopianisms appeal principally to the untrained mind, the proportion of trained minds in the 1960 group may not be sufficiently greater to avert similar enthusiasms. Voluntary decentralization, the shifting of population from metropolitan centers to rural regions, which already is going on, may be expected to increase. In suburban communities, architects of residences may find increasing demand for houses with a semi-detached "mother-in-law" apartment, making possible the focusing of two related households under one main roof, with privacy for each.

Standards of taste also may shift. Those born in the last decade of the Nineteenth Century have already seen the American novel develop swiftly from F. Hopkinson Smith to Sinclair Lewis; whether, with years and, possibly, greater leisure, they may constitute a special public is a matter for the consideration of writers. Greater sway by this group in the formation of public opinion is likely to mean a greater traditionalism; what are the traditions which will influence the public utterances and the voting, not to speak of the buying, of those who were boys when Theodore Roosevelt went to Cuba?

An apparent corroboration of the Committee's prediction, which is of special interest educationally, is the prediction of Provost Rufus D. Smith of New York University. He completes a study of population trends with the conclusion that high school enrollments, which have been steadily increasing, will begin

to dwindle after 1937, with a consequent diminution of college attendance after 1941. The post-War drop in the birth rate is responsible. In municipalities which have overbuilt institutionally, schoolhouses empty of children may in 1960 be utilized by graybeards seeking learning and instruction.

The conclusions of the Committee are, of course, based on the assumption that present birth and death rates, as well as present restrictions of immigration, will hold — an assumption subject to the play of such unpredictables as upset the AAA's crop-control schemes of a year ago. Halbert P. Gillette's studies indicating the possibility of a drought extending through the next decade are a case in point; such a drought could bring an increase in the death rate in sections of the country. The advances of medical research, in so far as they may reduce infant mortality, may alter the probabilities from the other end. Gains reported to the American Public Health Association from the use of a new cold vaccine and from the use of placental extract in the treatment of measles may point the way toward survival for more children in future. The old question of the hen and the egg, however, must also be considered, for the Association in convention at Milwaukee was told also that a decline of 57% in deaths from measles and of 53% in deaths from whooping cough in the last 10 years is largely to be attributed to the smaller size of families.



Hard service. A study in gears

Plaget



New York Times Studios

New York City within a frame of bridges (Brooklyn Bridge, above, Manhattan on the opposite page)

Achievements in checking deaths from heart disease and cancer, *per contra*, may, moreover, serve to maintain the proportionate increase of older people in 1960.

Insecticides from Coconuts

FATS are foods. Whether in the form of solids, or of animal or vegetable oils, they are also raw material for the preparation of soap. Soap is made by boiling the fat with caustic soda. The glyceride of the long-chain fatty acids is converted into the sodium salt of these same acids, and the product is ordinary soap.

Inedible oils of vegetable origin are now regularly converted by a process of hydrogenation into edible, lard-like solid fats, into glycerides of saturated long-chain acids, into substances which differ from the original oils only in containing more hydrogen. A slight modification of the process, however, results in the breaking up of the glyceride and the production from the acids of long-chain saturated alcohols. The alcohols with sulfuric acid yield acid sulfates, stearyl hydrogen sulfate, for example, and these form sodium salts which are readily soluble in water. Solutions of the sodium salts have the ordinary detergent qualities of soap solutions, but have the additional property of giving no precipitate with calcium and magnesium salts. They are soaps for use with hard water. Thus we get from fats two kinds of soap: one, the ordinary soap for use with soft water; the other, a special soap which works equally well whether the water is soft or hard.

It has recently been discovered that the straight-chain alcohols from fats have an insecticidal action. With the expectation that certain of their derivatives

would have a stronger effect than the alcohols themselves, studies have been made of a considerable number of them — and the rhodanates have been found to be the best. In tests upon aphids the effect has been found to depend very definitely upon the number of carbon atoms in the alcohol from which the rhodanate is derived. Lauryl rhodanate, from lauryl alcohol which contains 12 carbon atoms, is the most satisfactory. While the lower rhodanates, up to that of the six-carbon alcohol, have powerful and objectionable odors, the lauryl rhodanate has a mild and fatty one. The lauryl alcohol from which it is made is procured by the hydrogenation of coconut oil.

The material is used as a contact insecticide which kills the beasties not because they eat it, but because it comes in contact with their bodies. It is applied as a spray, this lauryl rhodanate — about one part in 2,000, being emulsified in water with the help of about two parts of sodium oleate or of fish-oil soap — and is used against black and green aphids, red spider, and so on, for which pests nicotine sulfate has heretofore been the usual treatment.

Toward a Better Patent System

SIMULTANEOUSLY with the termination of its period of appointment on December 1, appeared the final report of the Science Advisory Board appointed by President Roosevelt in August, 1933. Among its membership of 15 distinguished engineers and scientists were Dr. Frank B. Jewett, '03, of the M.I.T. Corporation, and President Compton (chairman). Dean Vannevar Bush, '16, served as chairman of an important subcommittee



The sky line of lower Manhattan across the East River from the Brooklyn water front

on the patent system. The Board dealt with problems of organization, programs, personnel, and coördination of the Federal scientific bureaus, and has reported a gratifying degree of accomplishment in a large number of matters of importance to the public. Specific parts of this important report will be treated in future issues of *The Review*; a summary of the report on the American patent system is included below.

The committee on patents seriously considered current proposals to abolish the patent system entirely. These have been advocated because of the present overcrowded and confused condition of the patent office and the courts where patent suits are tried. The report, while admitting that conditions are bad in many respects, holds that adequate cure for them can be found.

"The patent system in the past has been one of the primary influences in shaping American industrial life," notes the report, "and it has assisted enormously in the development of the country. In the considered opinion of those best able to judge, it is not, at the present time, functioning to full advantage. There are serious difficulties. The use of scientific results in industry is a much more complicated matter than when the patent system was first set up, and the system has not been altered to bring it closely in line with the modern complex matters with which it has to deal. If it is to fulfill its proper function to the greatest possible extent it is essential, therefore, that it be changed in certain ways in order that new industries may be stimulated and not inhibited by its operation.

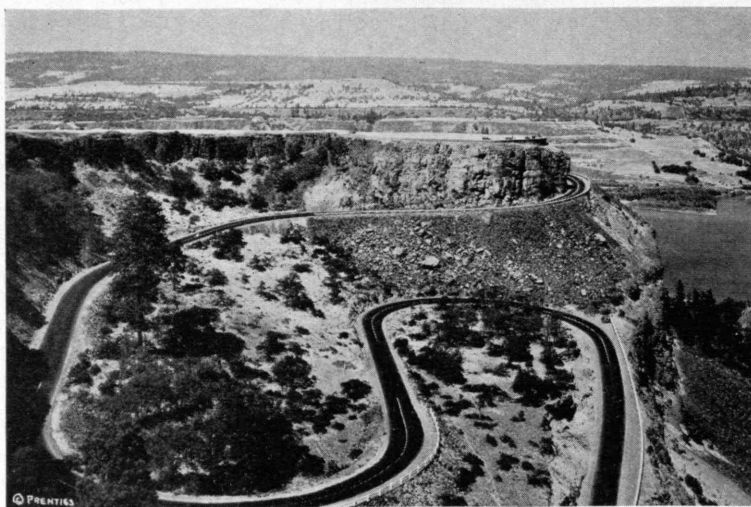
"The patent system of this country is old and has gradually developed into a complex structure. Radical changes in such a system should, of course, not be

undertaken without serious and careful consideration. It would be equally fatal, however, to refuse to consider alterations when the changed times dictate modification. It is in this spirit that the Committee has approached this work, in the attempt to combine a just conservatism with the willingness actually to face facts and conditions."

Present difficulties are traced by the committee to three basic causes: "There are three primary defects in the system as it stands at present, considered in connection with the functions which it is called upon to perform in a modern complex technical world. The first defect arises by reason of the issuance by the Patent Office of an enormous number of patents, many of which should never be issued, due primarily to an unduly low standard of invention. The second defect has to do with the excessive cost and delay in the litigation of patents, by reason of the present system of appeals. The third results from the difficulty met by the courts in handling scientific or technical questions without competent nonpartisan assistance.

"As these defects exist, there is a question in the minds of many serious-minded and experienced men whether the system is not, after all, more of a liability than an asset. It is seriously suggested that it has become so complex and cumbersome that it may break down of its own weight."

As remedies, the committee advocates, first, the publication of patents in the *Official Gazette* of the Patent Office before the patent is granted, instead of afterwards, as at present, with invitation to all interested parties to call attention to prior patent or publication on the same invention. If, after an (*Concluded on page 162*)



In Oregon along the Columbia River Highway, one of America's most famed roads

Highways on the March

New Lines on the Road Map of the World

By JOHN ELY BURCHARD

Let observation, with extensive view,
Survey highways from China to Peru.

OUR current decade may well be remembered, not by its great world depression, but by the tremendous expansion it has witnessed all over the globe in highway construction and planning. Here in the United States we have been building motor roads for such a long time that no single project we undertake seems very spectacular; here, too, we have no generally accepted and fundamental national highway plans. Much the same thing may be said of Great Britain and of France whose roads have been of such a high average for so many years. But elsewhere the story is different. Great national programs depend, in large measure, on national solidarity or, where that is missing, on the firm hand of a Fascist, a Soviet, or a Nazi government. It is not surprising, then, that three of the four great national programs of the decade are being carried out in Germany, Italy, and Russia. It is astonishing to find the fourth in China.

Reports from China these days are confusing and vary from day to day. Chinese activities, tempered in considerable measure by the threat from the North, are likewise affected by the fear of complete disintegration of a nationalism that has, for centuries, been none too fervent. Accordingly, it must be realized that whatever China projects today China may reject tomorrow. At the moment, however, the highway program stands almost first in her serious efforts to restore herself.

In common with Afghanistan, Ethiopia, and Liberia, China boasts one of the lowest motor-population ratios in the world; while of her 50,000-odd registered motor vehicles of last year perhaps one half were concentrated in the essentially foreign settlements of Shanghai and

Hongkong. Not so very long ago the first car ever to reach Kweichow province got there by being knocked down and carried over the mountains.

Significant, however, in the Chinese registration figures is the high proportion of busses. Under the guise of concessions, bus lines absolutely control many sections of highway on main trunk routes which are either not open to private cars at all or only on payment of very high fees. For example, in the relatively unsettled district of North China-Mongolia the fee for a round trip over the 800-mile highway from Kalgan to Urga is \$300 Mexican.

China's present program was initiated by the American Red Cross which, in 1921, earmarked 1½ millions out of 7 millions devoted to drought relief for the constructive relief afforded by highway building. The highways built at that time undoubtedly focussed the attention of the Chinese on their great problem — transportation. Conditions are so unbelievably bad that it costs nearly 16 times as much to transport goods by coolie there as by rail here. During the 1931 floods in the Central Yangtze, for example, it was cheaper to import wheat from the United States than to tap the heavy food surpluses of Manchuria. In 1932 to 1933 Hunan province had such a bumper rice crop that the farmers were grain-poor, yet in neighboring Kwangtung large imports of rice were made from abroad at less cost than they could have been made from Hunan. This poor communication has resulted in the establishment of independent regional zones with the military overlords which have been China's bane.

The Chinese government, then, realized that her 10,000 to 15,000 miles of railroad were woefully inadequate. At the same time she observed miles of rails

being abandoned in the United States because of highway competition. She leaped to the conclusion that the highway was about to replace the rail altogether. She has since realized that the two systems must complement each other; but highways are cheaper, the Chinese are poor, and it is in this atmosphere of poverty that the present program is being carried out.

In 1931 the longest regular route in China was from Kalgan to Urga and this was suitable for motor traffic only in winter when the ground was frozen. Prior to that time there had been feeble efforts by the Peking government to initiate a road-building program, but no national response was evoked. The Nanking government, however, began a serious movement as early as 1929, resulting in a six-year program which contemplated the construction of 200,000 miles of road by the end of 1935. This program, to be carried out under a bureau of public roads, contemplated 12 trunk lines, mostly radiating from Nanking. The principal of these were: (1) Along the coast south to the border of French Indo-China, now completed; (2) west along the Yangtze to Shasi, thence southwest to Talifu in Yunnan, thence to the Indian border, completed to Talifu; (3) west to Lhasa in Tibet, completed as far as Chengtu in Szechwan, the Texas of China, (about half way); (4) west to Hankow, then northwest to the Tien Shan Mountains and the western frontier, completed to the Gobi Desert (about one third of the way). Work on other major routes contemplated in this program has been sadly interfered with by uncertainty as to what might happen in Jehol, Changteh, and even Peiping.

Several things in China's program are in strong contrast to those of other nations. In the first place, frontier roads which would, of course, be of prime strategic importance have been quite generally deferred, indicating that China regards the economic aspect of her highways as superior to the military. Moreover, inasmuch as the establishment of communication has been regarded as all important, the roads are mere earth and will be macadamized only when conditions warrant and when funds are available. Considering the rainfall, the character of the soil, and other elements, this is a perfectly practical solution for China.

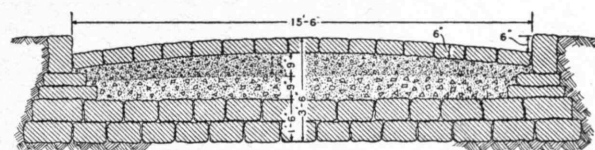
JAPAN

Japan's program is less ambitious. Possessing as she does, already, 100,000 miles of suitable all-weather roads, the problem of highways on her own islands does not press severely. She is widening and modernizing some 5,000 miles of national road and will shortly have a thoroughly modern road from Tokyo to Osaka. The principal factor in such program as she has is the need for unemployment relief and there is no demand for, nor any suggestion of, the express highway, the overpass, braided intersection, or many-lane type of road. Across the Japan Sea she is, of course, building highways with the same immediate objectives as those of Italy in Libya and, more recently, in Ethiopia. Here in Manchuria the lack of roads offers the same serious difficulties to establishment of order and economic autonomy as in China proper. The Manchukuan government, therefore, has a ten-year program for 37,500 miles of road financed by a bond issue floated in Japan.

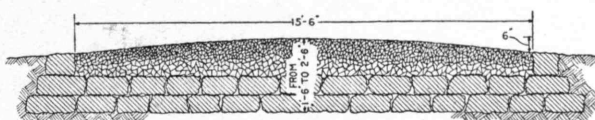
Japan's approach to this problem is perfectly realistic and frank. During the first few years roads will be built and improved to facilitate the movement of troops and the suppression of bandits. Roads purely for economic purposes will not be undertaken until the country is completely pacified. Paving is not planned for the near future but the damage done by the native-two-wheeled cart is recognized and separate provision will be made for them. The system is to be complementary to, rather than competitive with, the railroads. Work is to be done by gangs of ex-bandits and little machinery will be used because the use of bandit corps is part of a deliberate effort to wipe out banditry.

Principal among the roads now finished or under construction are: a hard-surfaced highway 66 feet wide from Dairen to Hsinking, the new capital; new motor highways from Mukden to Fushun and from Antung on the Yalu to Chengtzutung (the latter to connect with an existing road to Dairen).

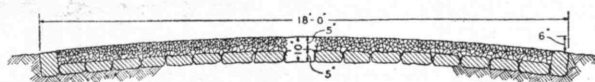
Inasmuch as the roads are frankly military, few will now be hard-surfaced, and the Japanese, though recognizing the disadvantages of dirt roads, have as yet



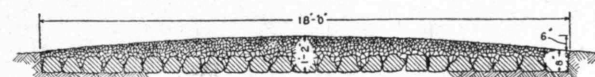
ANCIENT ROMAN 2-LANE MILITARY ROAD.



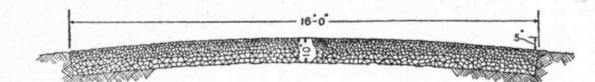
FRENCH ROAD (ROMAN METHOD) PREVIOUS TO 1775.



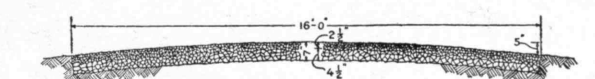
TRÉSAGUET ROAD, FRANCE, 1775 TO 1830.



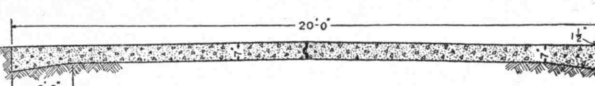
TELFORD ROAD, ENGLAND, 1820.



ORIGINAL MACADAM ROAD, ENGLAND, 1816.



MACADAM ROAD, UNITED STATES, 1900.



HEAVY-DUTY 2-LANE CONCRETE PAVEMENT, UNITED STATES, 1934.

Cross sections comparing the thickness of road surfaces in ancient and modern times. From "Via Appia" by Albert C. Rose, Senior Highway Engineer, U. S. Bureau of Public Roads, in the 1934 Annual Report of the Smithsonian Institution



Along the route of the Mexican section of the Pan-American Highway north of Mexico City. Top. Tourist Camp 175 miles north of Mexico City. The new road follows along the hill side above the rock slide. Center. The foreground road is typical, both as to width and surface, of many miles in the mountainous section between Jacola and Tamazunchale. Bottom. Section between Taman and Chapalhuacán. This is the old road that Mexico is replacing. Pictures taken last June

made no provision for maintenance. It is doubtful, therefore, that, even though available for private and commercial use, the roads of Manchukuo will have much immediate appeal to Americans. Japan's modern history, however, suggests that we will motor over these highways long before our tires slither with delight on Chinese roads.

U. S. S. R.

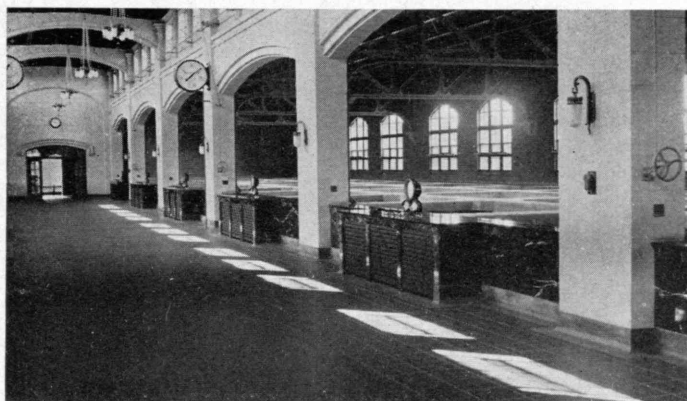
As in China, the Soviet government has fallen heir to a miserable highway system. But China, up to the Middle Ages when Genghis Khan turned the government over to the Mings, was noted for her highways; as in Italy, although they have gone to rack and ruin, these roads remain as well-laid courses for present development with much of the grading and orientation already accomplished. Russia, on the other hand, never has had any roads. Prior to 1914 there were but 15,000 miles of so-called roads in all the territory now belonging to the U. S. S. R. and most of these were mere ruts worn by the none-too-frequent passing of peasant carts.

By 1933 Russia had built, under the first five-year plan, 130,000 miles of new road of which but 100 miles were concrete and not over 10,000 miles could, by any possible American standard, have been called all-weather highways. Moreover, of these 130,000 miles some 85,000 miles were necessary merely to supply local needs in the absence of any roads whatsoever, so the trunk-line plan has not developed in Russia, despite the great mileage built. Under the second five-year plan the U. S. S. R. hopes to double the existing mileage, but she does not yet pin her faith on the highway for transportation economics and certainly does not rely upon it for war which she means to wage from the air. In these respects, despite the great total mileage built and contemplated, the Russian program has, by no means, the grandeur of the Chinese.

ITALY

In Europe, the outstanding developments, from a modern point of view, are to be found in Italy and Germany. The Mussolini government has been modernizing roads since 1928, although recent curtailments of budget forced by the colonial policy have practically stopped progress. The biggest part of the Italian work has been in the recreation of the old Roman routes, by resurfacing, widening, renumbering, and naming some 1,300 miles of road taken over from the provinces — perhaps one ninth of those ultimately to be cared for by the nation. Carefully cultivated Roman reminiscence is reflected in the names of these: a Cassian Way connects Rome with Florence; a Flaminian Way crosses the Apennines littoral; an Aurelian Way connects the capital with the French border; and, finally, the Appian Way, closely paralleling "Egina Viarum" of which Caesar was once curator, runs south to Naples, thence southeast to Brindisi and the heel of Italy. These roads, generally covered with water-bound macadam, will be acceptable to the American motorist but are no better than the average road in France.

As a kind of side issue, one finds here and there in Italy for a total of about 300 miles, the *autostrade*. These roads are first-class, (Continued on page 151)



T. R. Camp, '26

Protecting our water supplies. Filter operating galleries at Saginaw, Mich. (left), and Belleville, Ont. (below)

Training for Public Health Administration

Is a Medical Degree a Primary Prerequisite?

BY MURRAY P. HORWOOD

IN a recent address delivered by Dr. E. L. Bishop, retiring President of the American Public Health Association,* some of the outstanding public health problems of the present day are clearly and specifically described. It is stated, for example, that "while all of our states have some form of state health organization, in many instances appropriations and personnel are insufficient to provide for even the most basic functions of a state health department. It is, however, in local health service that the most glaring deficiencies are shown, for of the more than 3,000 counties of this country, only 540 have provided even the foundations for whole-time health service, and some urban areas have organizations equal only to the most rudimentary requirements. It is in the state and local elements of our health machinery that the greatest structural weakness lies and, until these weaknesses are strengthened, many sections of the country will be either partially or wholly without facilities through which the full values of present opportunities may be grasped." It is evident, therefore, that the opportunities for public health service in the United States are still very large in spite of the splendid progress which has been made since 1880. The existence of numerous opportunities for public health service will demand properly qualified personnel, and those who are interested in the education of young men and women for service in the field of public health must

naturally be concerned with the scope and standards of the educational process for public health practitioners.

That the educational process for public health service is receiving serious consideration on a national scale is indicated by various facts, only two of which need be mentioned here. Dr. E. L. Bishop, in the address referred to above, says, "The present condition of haphazard employment of untrained or inadequately trained personnel can be transformed into a system whereby individuals deliberately train for a career in the public health service of some unit of government, and ultimately we may look forward to the time when such work constitutes a career service in the best and fullest sense of

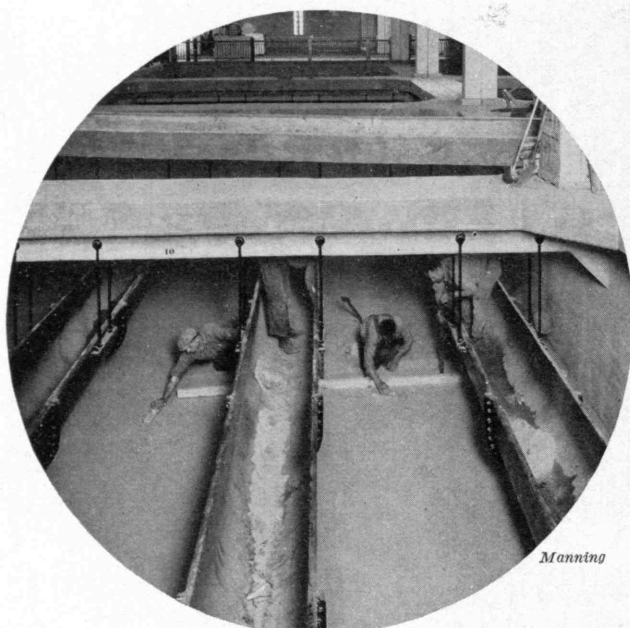
that term. This program of training will do more to exclude partisanship and consideration of political expediency from public health organizations than all the statutes that might be written, for it insures a service which will win public esteem because of its merit. It is a fundamental step forward not only in the betterment of the public health, but in the betterment of government itself, for it recognizes the principle of trained public servants for public service."

Certainly there can be no difference of opinion concerning the wisdom of providing trained public servants in the field of public health, employed on a full-time basis and freed of the political interferences which make tenure of office problematical and which interfere with effective service. All will give active support to this objective.



T. R. Camp, '25

* "Public Health at the Crossroads," *A.J.P.H.*, November, 1935, v. 25, No. 11, pp. 1175-1180.



Smoothing filtration sand, Springwells Station, Detroit

Recently, however, a national Committee on the Professional Training of Health Officers, composed of 11 members — eight of whom were physicians, one a public health nurse, one a public health engineer, and one a biologist and expert in health education — considered the question of the minimum educational requirements for public health administration, and presented a divided report, eight to three, in favor of a policy which would exclude all who are not physicians from the field of public health administration. Since the conduct of a progressive health department includes the services of public health engineers, sanitary chemists, bacteriologists, biologists, statisticians, experts in health education, and public health nurses, as well as physicians, the point of view adopted by the majority report automatically becomes a matter of serious moment for all who are professionally trained to render service in the field of public health but who are not physicians.

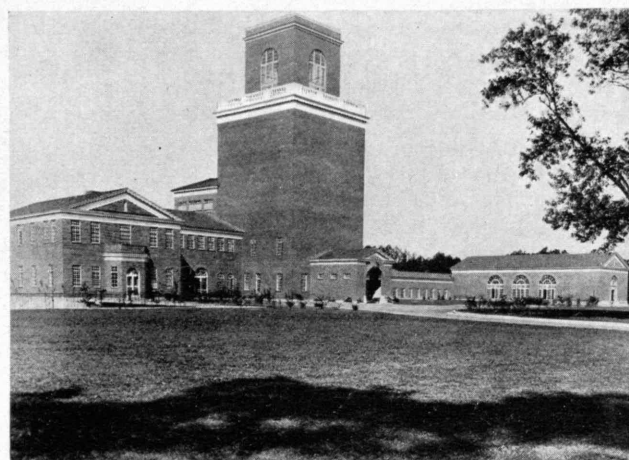
The majority report states: "In practice in the United States there have been in the past many non-medical health officers, some of whom have served with such distinction as to demonstrate conclusively that a suitably educated individual, not a doctor of medicine, can administer a health department efficiently and well." The very next statement in this report, however, says: "While there are many positions in the field of public health which can well or best be filled by workers well educated in the theory and practice of public health but not possessing a medical degree, the position of administrative health officer, whether of state, city, or county, demands in general the possession of medical as well as public health training."

This last point of view, which goes contrary to the best experience and practice in public health administration in the United States, should command the interest and attention of the professionally trained personnel who render service in the field of public health, as well as the greater body of enlightened citizens in the United States who are anxious to improve public service ad-

ministration in all of its aspects. In this way effective opposition may be presented to this unfortunate attitude which may become policy. Accordingly, the following facts have been marshaled and briefly presented in order that a more enlightened view may prevail. This question is destined to come up again and again, particularly as nonmedical contributions to the cause of public health continue to be numerous and significant.

Public health practice touches the life of a community in all of its aspects — engineering, social, educational, economic, statistical, as well as medical. The great progress which has been made in the control of disease and premature mortality has been accomplished very largely through control of the environment, through education, through the use of biological products and the laboratory, and through statistical methods. In so far as clinics have aided in the control of disease and death, the assistance has come largely through the early and prompt detection of disease and defects, in order that educational procedures or corrective measures might be instituted without delay. In fact, the salutary effect of certain clinic services has been largely the result of hygienic instruction, often carried out by lay people, rather than through medical procedures. The whole history of the public health movement is intimately and irrevocably linked up with the significant contributions of nonmedical men and women. Why, then, this insistence that the public health must be administered by physicians alone? The Committee on Professional Training of Health Officers admits that non-medical men properly trained in public health have administered and are still administering the public health in a most effective and efficient manner. Is this not in itself an admission that the medical degree is not the primary prerequisite for efficient public health administration, but that sound training in the principles and practices of public health coupled with desirable personal qualifications are the fundamental requirements?

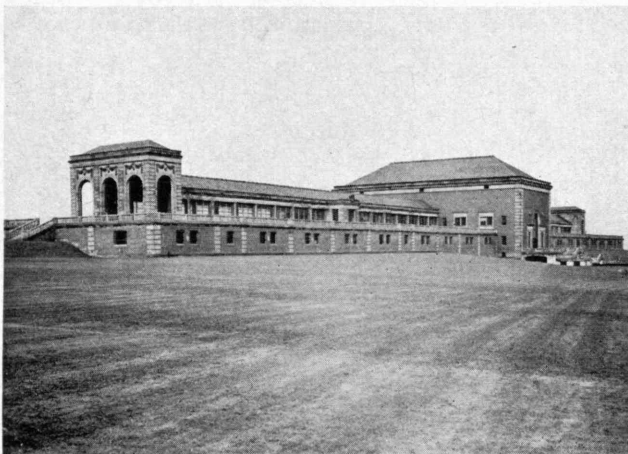
Progress in public health has not been the result of medical activity alone. It has been the result of the innumerable painstaking, careful contributions of many nonmedical workers from the time of Pasteur, Chadwick, Shattuck, Sedgwick, Fuller, and Whipple down to the leaders such as Winslow, Walker, Palmer, Vaughan, Osborne, Mendel, McCollum, and so on.



Rapid-sand filter plant, Washington, D. C.

The field of medicine is too big and too broad today to be dependent for progress on the work of physicians alone. The basic underlying sciences, such as bacteriology, physiology, biochemistry, and anatomy, are peopled by splendidly trained nonmedical workers who are making valuable contributions to medicine as well as to the public health. Science, even medical science, is so dependent on the researches of the physical and chemical laboratories that it is unreasonable to assume that the physician is or can be omnipotent or omniscient in his relations with his fellow professional workers. In fact, with the passage of time, medicine must become more and more dependent on the contributions emanating from the physical, chemical, and biological laboratories. Nonmedical public health workers of creative genius and administrative excellence should not be required to accept a subordinate position in the administration of the public health simply to satisfy the whim or bias of any group.

If the record of trained nonmedical men in public health work were poor or unsatisfactory, there might be more logic in the stand taken by the committee, but the situation is exactly the reverse. It is universally admitted that, in the engineering phases of the public health movement, the nonmedical sanitarian has excelled. Long before certain parts of the medical profession became public-health minded, organized public health instruction was available in this country at the M.I.T. and significant contributions were being made in the purification of water supplies, the treatment of sewage, the sanitary production of milk and food supplies, air sanitation, disinfection, the control of communicable diseases, industrial hygiene and sanitation, personal hygiene, health education, and even public health administration. The graduates of this school, as a group, have played a most significant rôle in the development of the public health survey as an instrument for the promotion of the public health. They have been leaders in the public health movement in this country and abroad; they have held important places in the affairs and councils of the American Public Health Association; and they have contributed frequently to the scientific discussions of the Association at its annual meetings. Most of these men have not been physicians, thus giving support and emphasis to the conclusion of



Baldwin filtration plant, Cleveland



Queen Lane slow-sand filter, Philadelphia

the committee that nonmedical public health workers have administered the public health efficiently and with great success.

It is generally known that the health survey of 86 cities, conducted by the American Child Health Association in 1924, was a significant contribution to public health administration in the United States. Of the seven men who organized this study and carried it through to completion, five were trained as nonmedical public health workers. This study, together with those conducted by the Committee on Administrative Practice of the A.P.H.A., led to the formulation and adoption of the City Health Appraisal Form — a notable instrument for promoting progress in public health administration. The leading spirit in this undertaking was a nonmedical sanitarian. The chairman of the Committee on Administrative Practice is a nonmedical sanitarian. The first and second field secretaries of the Committee, following the adoption of the City Health Appraisal Form, have been nonmedical sanitarians; and the cities that received the highest scores in their respective groups — the large and medium-sized cities — when the City Health Appraisal Form was first applied, were cities whose health departments had been built up and administered by nonmedical health officers. It would almost seem from the evidence that the Committee on the Professional Training of Health Officers should have concluded that effective public health work does not require and does not presuppose the possession of a medical degree.

It has been argued that since the public health deals with the prevention and control of disease, and since disease is the province of the physician, then the public health should be administered by physicians only. That such an assumption is erroneous, even a slight examination of the facts will disclose. It does not require a medical knowledge of typhoid fever to bring it under control through the purification of water supplies, the proper disposal of sewage, the (Continued on page 154)



*Tower of New York's Triborough bridge during construction.
High stress members are of high-silicon structural steel*

IN 1914 two events occurred which gave to alloy steels a remarkable impetus. One was the outbreak of the World War; the second, the commercial production of stainless steel. Today, 22 years after these epochal events, I venture to envisage the position of alloy steels in 1944, 30 years from their coming of age. From the viewpoint of logical engineering applications and economic advantages, what are the impending possibilities of these materials which are now undergoing such a remarkable development?

Alloy steels today may broadly be divided into three classes, and it is surprising how little overlapping exists between these three groups. Such overlapping as does exist may be considered the exception that proves the rule. The first category comprises the low-alloy structural steels used in the as-rolled condition or, occasionally, normalized—a relatively new commercial development bidding fair to run into large tonnages within a period of months. The second group consists of the heat-treated engineering and tool steels. This is already an important development of many years' standing. This group is ever growing larger and as yet no threat of substitution by products having other than the ferrous base is apparent. The third classification is constituted by the rapidly growing group of stainless, corrosion-resistant, and oxidation-resistant steels. The essential properties of this group are unique, and the economics of these steels, both with respect to lowered initial cost and lowered final cost in service due to intelligent application, are constantly improving, so that we may well take the view that this development is still in its infancy and will attain a major stature within the decade.

The Future of Alloy Steels

How Important Will They Be in 1944?

BY A. B. KINZEL

Considering the above-mentioned steels according to the classifications given, the first item requiring attention is the place of the low-alloy structural steels in engineering. That such steels will not fulfill some of the speculative predictions and eliminate carbon steels completely is obvious to anyone familiar with the principles of construction, and is based on the same fundamental reasons why steel has not eliminated cast iron, namely: strength and ductility are only two factors in structural design, rigidity being a third and very important one. Rigidity depends on the elastic properties, and, as yet, we have made no appreciable change in the modulus of elasticity of low-alloy steels. A beam of a given length and a given section made of alloy steel, when used within the elastic range, will deflect no more than a similar beam made of carbon steel. However, proper distribution of the same cross-sectional mass of alloy steel will materially reduce the deflection of such a beam and increase the maximum tensional and compressional fiber stresses to a point well within the safe limits of design if alloy steel is used, but well beyond the safe limits for carbon steel; that is, in a great many instances it will be possible by more intelligent use of the material so to design a structure that tensile strength and not deflection will be the limiting factor. An illustration of such an application is the use of low-alloy steel in side plates for freight cars. The alloy-steel side plate is of smaller gauge than the plain carbon-steel plate which it replaces, yet, due to the fact that the alloy-steel plate is given a dish, its rigidity is fully the equal of the thicker carbon-steel plate.

When the limiting factor involved in the design becomes tension or compression, the alloy steels may be used to full advantage. Reduction in weight and increase



Faster, safer, more economical transportation is made possible by the use of alloy steels in trains

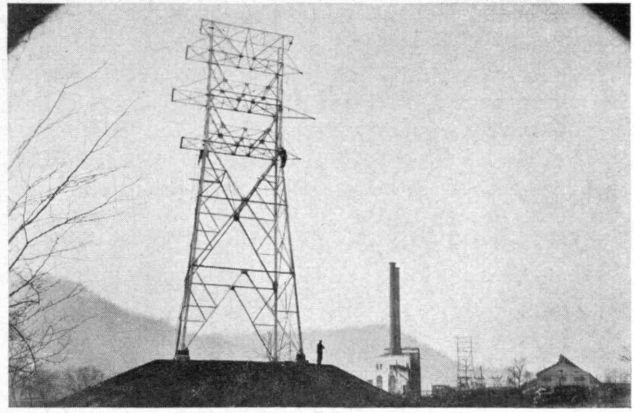


Many heat-treated alloy-steel parts were used in the construction of this mammoth steam shovel

in engineering efficiency are immediately achieved in direct proportion to the increase in yield point and ultimate strength. Thus, the possible field of application is tremendous, although it does have some definite limitations.

The question of yield point and ultimate strength is also worthy of attention. For many years, maximum tensile strength was the design criterion. Today, many engineers use yield point with a lower, apparent factor of safety. Fatigue has long been known to be a factor directly dependent on tensile strength. In any event, the design fiber stress is always well below the yield point, so that the choice of tensile strength in structures built of ductile steel is indicated as a procedure which is both more comprehensive and more conservative. It carries the weight of years of successful practice and may well again attain its hitherto undisputed position in the design of members subjected to other than purely static forces.

The use of these steels in railroad construction has been particularly interesting. The problem of light-weight trains has been studied, and experiments have been performed in all of the modern industrial countries. Leading opinion in each case indicates that for normal transportation and freight-car construction the low-alloy steels result in sufficient reduction of weight to effect a very real saving without, at the same time, so revolutionizing the character of the rolling equipment as to necessitate a new point of view on the whole



Transmission-line tower with angles forming the lower main legs fabricated from Cromonsil steel

industry, bringing with it unknown factors and dangers. In the passenger field, both the low-alloy structural steels and the stainless steels have met with success — the choice depending upon the type of equipment envisaged. Both of these types of steels give weight saving together with stability, excellent fatigue resistance, and retention of requisite physical properties during their life, even when exposed to comparatively severe climatic conditions.

One may well consider the nature of the low-alloy structural steels. Obviously, the prime requisites are elevated yield point and tensile strength, and in a great many of the steels in question now on the market these values will run upward of 50,000 and 75,000 pounds per square inch, respectively.

The ability to fabricate the steels is the next major item, and in the as-rolled steels this may generally be measured by two factors: the ductility and the air-quenching properties. It is usual to think of these steels in two categories. The first embraces steels having approximately 75,000 pounds per square inch tensile strength, in which the ductility is of the same order of magnitude as that of 50,000 pounds per square inch plain carbon steel and the air-quenching properties sufficiently reduced as to be negligible. These steels may be considered to be the relatively foolproof welding steels and generally contain less than 0.14% carbon and sufficient alloy to bring the strength within the predetermined limits. The combination of properties makes them ideally suited to present manufacturing processes — forming, flame cutting, and welding of any type. The second includes steels having 90,000 pounds per square inch tensile strength, with ductility corresponding to that of 60,000 pounds per square inch plain carbon steels and air-quenching properties of sufficient magnitude as to require special precautions in any operation involving involuntary heat treatment. When welded, such steels should be stress relieved or tempered, one operation effecting both purposes. Gas cutting should be carried out with special precautions. These high-strength structural steels are perfectly adapted to riveted construction in the field or shop, using special alloy high-strength rivets, and to welded construction in the properly equipped shop. These steels will generally contain from 0.18% to 0.24% carbon, and in some



Stainless-steel breakfast set. 140,000 people saw this exhibit at the Metropolitan Museum, New York

instances the carbon content may be still higher. In general, however, the higher the carbon and the lower the total effective alloy content, the greater the precautions to be taken in flame cutting and heat treatment.

The carbon content of the above steels has been mentioned and it is true that, up to the present time, the carbon ranges quoted apply generally, regardless of the specific alloying constituents. Future work may modify this condition, so that even lower carbon content may be used for given high strength in specific steels. Many of the common elements have been used in the modern as-rolled structural steels. Chromium, manganese, silicon, nickel, molybdenum, vanadium, and copper are each present in combination in one or another of the various brands of steel on the market today. Many theories have been advanced as to the reasons for the use of one or another of these alloys. It seems to be agreed generally that copper in excess of 0.5% improves corrosion resistance and increases tensile strength, but the degree of improvement, as well as the added improvement by increasing amounts up to 1.5%, is a question, the answer to which awaits further data. Again, it is generally agreed that when copper reaches 0.5% or more, alloying elements are necessary to retain good rolling surface unless special precautions are taken. Nickel, chromium, manganese, and silicon are each believed to be effective in this connection, although the listing of silicon in and the omission of molybdenum from this group are open to considerable argument.

The choice of elements to strengthen the low-carbon steels is a wide one. It is common knowledge that chromium, manganese, silicon, nickel, and molybdenum all effect this result, and, when used in proper amounts and proper combinations, not only give the desired strength but also the desired ductility. Arguments to the effect that some of the elements are carbide formers and others simply go into solid solution are interesting, but it should always be remembered that each of the elements in question will materially strengthen the ferrite lattice by solid solution and that the fact that a given element is a carbide former does not affect its solubility in the ferrite when the carbon is low enough. This means that by using properly balanced alloys, *i.e.*, by the proper adjustment of composition, similar final results may be achieved with any of the steels in the above group. Specifically, steels with approximately 1% chromium, 0.40% manganese, 1% silicon, 0.10% carbon, and 0.50% copper, with or without phosphorus for added corrosion resistance, and steels with approximately 0.50% chromium, 1.25% manganese, and 0.75% silicon, with or without copper, and carbon at maximum 0.14% for one type and about 0.20% for the higher strength material, as well as 0.8% chromium and 0.2% molybdenum with two carbon ranges, are representative of the chromium type as-rolled high-strength steel, whereas steels with 0.5% to 2% nickel and 0.5 to 1.5% copper, with or without approximately 0.5% molybdenum, are typical of the nickel group. Only experience will tell the relative specific advantages in addition to the usual tensile properties of these two types of structural steels, but the burden of proof would seem to rest on the second group because of the definitely lowered cost

of alloy additions of the first group. A third group might be designated as the manganese type, with manganese at 1.50% and carbon to suit, with or without copper, molybdenum, or vanadium. Unless rolling conditions are very carefully watched it is frequently necessary to normalize these steels unless vanadium is present. The vanadium reduces the rolling sensitivity and produces an as-rolled steel which compares favorably with those of chromium and nickel groups.

Would it be rash to hazard the prediction that the as-rolled steel of 1944 will be based on those alloying elements which can be had for less than \$.15 per pound of element; that ultimate strength will be emphasized over yield point; that air-quenching properties will be accorded increased importance; that ductility requirements will be moderated; that corrosion resistance will carry less weight than today. Such are the logical inferences based on the lessons the past has taught metallurgists and engineers.

The second general group of steels mentioned in the opening portion of this paper covers those steels which are to be heat treated by a quenching and drawing operation, and comprises, among others, the entire S.A.E. series from 2,000 on. In a given tensile range, with properly selected heat treatment, it is probably true that the physical properties of one or another of these S.A.E. steels, as measured in the usual tensile tests and other tests of a similar laboratory type, will not differ appreciably. Selection of one or another of these steels will depend upon additional characteristics, such as machinability, tendency to distort on quenching, range of quenching temperature, resistance to decarburization, and the like.

In these steels, chromium, nickel, molybdenum, and vanadium are the prime alloying constituents suitably added to manganese and silicon. The tendency throughout industry today is to discount initial cost of the steel and to pay more attention to final cost of the finished product. This is made possible by grain-size control and other particular specifications which lead to ultimate economy. Because of this situation and because of the very minor differences in special characteristics that determine the selection of one or another of these steels, we do not expect to see a very great change in this field of activity, although we may well see certain of the steels now in the S.A.E. list favored above others because their ultimate economy will be more readily appreciated and understood. Specifically, the chrome-vanadium steel is used for carburized gear steels by some of the largest producers. Although its initial cost is greater than some of the other steels given in the list, the ultimate cost of the finished part is effectively reduced. Again, the nickel-chromium type finds great favor for transmission gears, although from the standpoint of simple physical properties other steels might appear to be attractive to the automotive engineer. The chromium-molybdenum-nickel steels have special advantage in certain pinion and ring-gear applications because of the retention of dimensions on quenching and so pay for themselves, even though the initial cost may be greater than that of another steel which on casual inspection would seem to have the same physical properties.

(Continued on page 156)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

Crystals of Research

ARTIFICIAL growth of large and optically perfect lithium-fluoride crystals, which, because they transmit farther into the ultraviolet region of the light spectrum than any known optical material, hold promise of extending the horizon of atomic research, has been accomplished in the Department of Physics.

Formal announcement of this triumph of synthesis, the result of several years of patient research by Professor Donald C. Stockbarger, '19, was made at the meeting of the American Physical Society in Baltimore on November 30, when several crystals, including one three inches in diameter, were exhibited.

The ability of lithium-fluoride crystals to transmit light far exceeds the range of natural quartz crystals, fused quartz, the best optical glass, or rock-salt crystals, all of which fail to transmit any but the longer waves in the ultraviolet region of the spectrum. Lithium-fluoride crystals transmit light waves from higher in the infrared region through the visible band and deeper into the invisible ultraviolet wave region than any known substance, including fluorite, the extremely rare natural crystal of calcium fluoride which is seldom found in a size or of an optical quality suitable for research.

Lithium fluoride promises to have important uses even for light of the visible range, because it refracts the different colors of light far more equally than does any other known optical material. For this reason, lenses of the material are less subject to chromatic aberration which, with glass or quartz, makes necessary the use of compound lenses in order that the optical images of an object in one colored light may not be blurred, while those in another colored light are sharp.

In its application as a new tool of science, the lithium-fluoride crystal is expected to play an important rôle in spectroscopic investigations, particularly in atomic research on liquids and some gases, which must be confined in some form of container permitting the transmission of light over the widest possible range of wave lengths. The crystals may also be an important contribution to the field of microscopy, for at present calcium fluoride is used in combination with certain glasses in microscopic lenses. It is anticipated that the artificial lithium-fluoride crystals may replace calcium fluoride for this purpose. A microscope equipped throughout with lithium-fluoride lenses would make possible investigation of objects with much shorter wavelength radiation than is now possible with quartz microscopes. Thus greater resolution may possibly be obtained, bringing within range of investigation much smaller objects than can now be studied.

A method of growing lithium-fluoride crystals large enough to be useful for research has long been sought, but up to the present little success has been realized. The success of this method lies in the synthesis of lith-

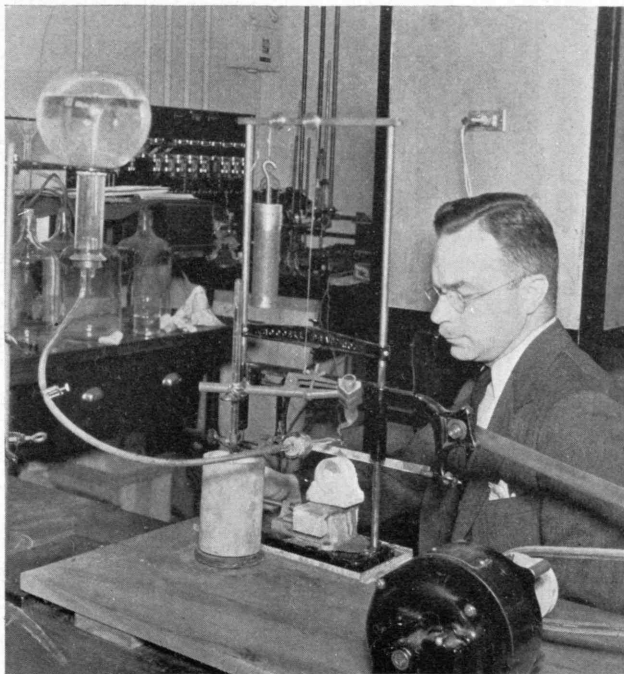
ium-fluoride salt in the purest form, and the growth of crystals in an electric furnace of special design and capable of precise temperature control.

Lithium is a soft, silver-white, metallic element of the alkali group. It occurs in several minerals, but always in the form of a combination. As a chemical, lithium fluoride is a relative of common table salt, which is a combination of sodium and chlorine. Lithium belongs to the same family of elements as sodium, whereas fluoride is a member of the chlorine group.

In the process of growing crystals by the new method the lithium fluoride is produced in the form of a powder and melted in accurately shaped platinum crucibles with conical bottoms. After the substance has been melted the slow process of cooling begins and a tiny seed crystal forms in the point of the crucible, continuing to grow until the material has entirely crystallized. Lithium may be cut and polished easily.

Synthetic Earthquakes

SO much has been written about the recording of earthquake motions that the layman is apt to imagine that the science of seismology concerns itself



The artificial growth of large and optically perfect lithium-fluoride crystals which transmit light over a wider range of wave lengths than any known optical material, has been accomplished in the Department of Physics at the Massachusetts Institute of Technology. Professor Donald C. Stockbarger, who achieved this triumph of synthesis, is shown with a three-inch crystal, which is being sawed into sections for use in optical research apparatus. These artificial crystals hold promise of extending the horizon of atomic research



Testing water tanks with synthetic earthquakes. The white shadowgraph (or optical cam) in the right foreground is made from the record of an actual quake, and, through an electrical system, causes the table upon which the tank stands to move as the ground did in the actual quake. Arthur C. Ruge, '33, who developed the apparatus, is reading the instrument in the left foreground. See adjacent story

almost solely with that task. As a matter of fact, recording is indispensable to earthquake study, but it is, after all, only a means to an end.

What are the seismograph records used for? The geophysicist studies them in order to learn more about the nature of the interior of our earth, to study the causes of earthquakes, and to obtain data on the points of origin, speed of wave travel, and so on. We might say, his studies extend from the earth's surface downward. In direct contrast is the practical engineer, who studies the seismograms from the standpoint of the effects of quakes upon buildings and other engineering structures. His field of interest is primarily from the earth's surface upward.

The most promising means of attacking the engineering problems of seismology seem to lie in the application of model study to the subject. But, having built a suitable model of an engineering subject, the engineer is faced with the task of producing artificial earthquakes in order to test the resistance of the model. This problem is inverse to the familiar one of recording earthquakes. Thus, the usual problem is: given the earthquake, to record its motions faithfully. The engineer who conducts research on models is confronted with the far more difficult inversion of this: given a record of the earthquake, to reproduce the earthquake faithfully. This reproduction has to be done with due regard for the laws of models, which usually means that the artificial quake

must be made much faster and smaller in its motions than the original, yet it must be a true scale copy of the original in all details.

At Technology, in the Department of Civil and Sanitary Engineering, Arthur C. Ruge, '33, research associate in seismology, has devised a machine which solves this problem in a remarkable manner. The design was developed in consultation with Vannevar Bush, '16, Vice-President of the Institute and Dean of Engineering. Though complex in its details, the general principles of the machine are relatively simple, and its operation is scarcely more difficult than the operation of a radio receiving set.

A "shadowgraph" (or optical cam) is made from an earthquake record, by cutting the record out along the wavy line which represents the quake. The top part is discarded, and the remainder (the shadowgraph) is passed with a uniform speed before the electric "eye" of the machine. An electric analyzing device coupled to the eye performs the function of a brain and controls the machine in such a way that it is forced to follow the wavy line as the shadowgraph moves along. A beam of light moved by the machine enables the eye to see whether it is following properly along the shadowgraph.

The primary driving power of the earthquake machine is obtained from oil under pressure working against a piston connected with the moving table. The electric analyzing device controls a valve which feeds the oil into the piston chamber. This valve is moved in exactly the same way that a radio receiver moves the diaphragm of a dynamic loud speaker, except that the force available for moving the valve can reach a maximum of nearly 50 pounds, and consequently it can move very fast.

Such a machine is broadly referred to as a "shaking table." Those shaking tables which have been built in the past were capable only of simple back-and-forth motions; at most, a mechanical cam drive could be used to give certain motions of irregular character. There was need for a machine possessing a great deal more flexibility than the existing shaking tables. The new M. I. T. machine does away with expensive and cumbersome mechanical cam drives and has absolutely no limitations as to how irregular a quake it can reproduce. Furthermore, it can reproduce nonrepeated, irregular motions which continue for so long a time that no mechanical cam could be made for producing them. To change from one quake motion to another, it is necessary only to pass a different shadowgraph in front of the eye of the machine.

Although it can produce forces of over 2,000 pounds when necessary, one of the interesting features of this shaking table is that it produces only the amount of force needed to make it follow the shadowgraph properly. If a model is being shaken on a table, the machine's thinking device automatically regulates the forces on the machine in such a way that the reaction (or "back kick") of the model does not change its motion from the required path. This is another advantage which the earlier machines did not possess.

Provision has been made for the future addition of another drive at right angles to the first, so that motions of a more general character can be reproduced. For instance, some earthquake motions look like the figure 8,

some like 0, and so on. It is also possible to add a vertical component to the machine if that becomes necessary in the course of future research.

Up to the present, only a few quakes have been recorded near or in damaged areas. Fortunately, the United States Coast and Geodetic Survey is now equipped to record all strong earthquakes in the western part of the country and information of great engineering value is being gathered. The shadowgraph shown in the accompanying picture was made from a record of the Long Beach, Calif., quake of 1933. It is believed that this is the first time a locally recorded earthquake has been reproduced in a laboratory anywhere in the world. In fact, the earthquake of 1933 was the first one in which complete local records were made anywhere in the world, the instruments having been built by the United States Coast and Geodetic Survey especially for recording strong shocks. On all previous occasions, only a few of the first tremors were recorded before the existing delicate instruments went out of action entirely.

This machine has other possible applications, as in the field of mechanical vibration study, but it is expected that it will be used principally for model testing in engineering seismology research. In the picture on the opposite page a model of an elevated water tank is shown mounted on the shaking table ready for testing with actual scaled-down earthquake motions. Various new designs are thus tried out before deciding on what design should be adopted for actual construction.

From Far Places

TECHNOLOGY continues to draw students from all quarters of the globe, and a total of 139 foreign students are registered at the Institute this year. They come from 35 countries, China leading with 35 students and Canada next in order with 29. Twelve of the foreign students are from Cuba, six each from England and India, five each from Argentina and Japan, four each from Mexico and the Union of South Africa, and two each from Australia, Austria, Belgium, Honduras, Iraq, Turkey, and Venezuela. Represented by one Technology student apiece are: Brazil, Colombia, Denmark, France, Germany, Guatemala, Ireland, Netherland Indies, Netherlands, Norway, Panama, Persia, Poland, Scotland, Siam, Soviet Union, Sweden, Switzerland, and Syria.

Students representing the territories and dependencies of the United States include one from Puerto Rico and one from Hawaii. The Institute's total registration of 2,540 includes students from 34 states and the District of Columbia. The North Atlantic States students number 1,877, with Massachusetts contributing 1,088 and New York State 361. North Central States furnish the next largest group, 261. Then follow in order: the South Atlantic group, with 106 Technology representatives; the Western group, with 101; the South Central, with 51.

Andrew Carnegie

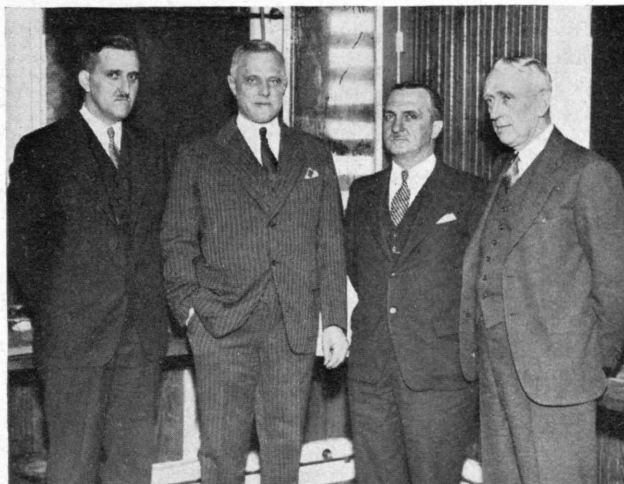
ALL educational institutions, research foundations, and libraries which have benefited by the generosity of the late Andrew Carnegie united on November 25

in celebration of the 100th anniversary of the birth of their benefactor, who regarded his great wealth as a trust to be administered for the good of mankind.

The Institute has been able to carry on important research in many fields through financial aid received from Carnegie Funds. Of special interest at Technology is the work of President Compton and Professor Joseph C. Boyce, who for several years have been engaged in a study of the spectroscopy of the extreme ultraviolet, under a grant by the Carnegie Corporation, which is administered by the Carnegie Institution of Washington.

Ordinary photographic methods of spectroscopy can be used for the octave of frequencies of light above those which are visible to the eye, but at higher frequencies, that is, shorter wave lengths, air becomes opaque and investigations must be carried on in an evacuated container. The difficulty of attaining a vacuum in large chambers has been a serious barrier to obtaining accurate results.

A grant from the Carnegie Institution in 1929 made it possible for Dr. Compton and Professor Boyce to proceed with the construction of an improved type of vacuum spectrograph which gives a considerable increase in accuracy over a broad range of wave lengths. This apparatus is now in the Institute's spectroscopy laboratory and it has made possible a revision of the standards of wave lengths in the region for which it was designed, as well as analyses of new spectra.



Among the many distinguished guests who attended the recent inspection of the Institute's research station at Round Hill, on the estate of Colonel E. H. R. Green, were several government representatives. Shown here (reading from left to right) are Delbert M. Little, Chief of the Aerological Division of the United States Weather Bureau; President Compton; General Oscar Westover, Acting Chief of the Army Air Corps; and Lieutenant Commander Joseph B. Anderson, who is in charge of the Division of Meteorology of the Naval Bureau of Aeronautics.

It was during this inspection that President Compton, in explaining the purposes of the high voltage nuclear research program, announced that the Institute's research staff had developed an improved method of measuring extremely high voltages. Thus, he explained, intelligent guesswork had been supplanted by precise measurement. The new method extends the range of accurate measurement to about five times the voltages accurately known at the time the program was undertaken. As a result of this important advance, high voltages hitherto reported are known to be considerably overestimated.

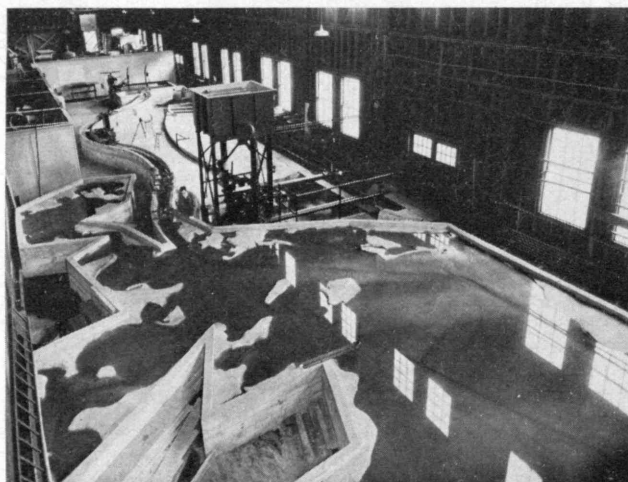
The new cosmic-ray meter, recently installed at the Institute following its development under the direction of Dr. Arthur H. Compton, President Compton's brother, was also made possible by a grant from the Carnegie Institution, which is sponsoring a world-wide study of variations in the intensity of cosmic radiation. Professor Ralph D. Bennett of the Department of Electrical Engineering, contributed importantly to its design.

Honors

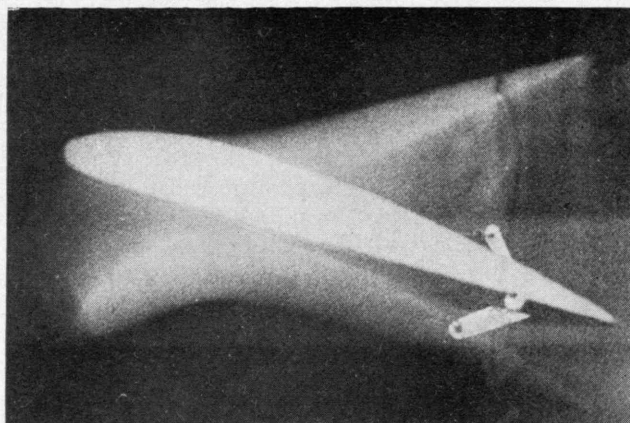
OUTSTANDING honors have come to two members of the Institute's Faculty, Professor Edward R. Schwarz, '23, of the Department of Mechanical Engineering and Dr. Warren K. Lewis, '05, of the Department of Chemical Engineering.

Professor Schwarz was elected vice-president and director, as well as a member of the executive committee, of the United States Institute for Textile Research, Inc., at its annual meeting last month. He is chairman of the board of editors of this organization and a member of the research council of its research committee. He is also a member of the advisory and editorial committee of the Textile Foundation, a member of the American Association of Textile Chemists and Colorists, and a fellow of the British Textile Institute. Under Professor Schwarz's personal direction, Technology has developed, since 1925, one of the best equipped textile microscopy laboratories in this country, and possibly in the world.

Dr. Lewis will be awarded the Perkin Medal for 1936 at a meeting of the Chemical Club in New York on January 10 at which time he will present a paper on "Application of Physical Data to High-Pressure Processes." The Perkin Medal, founded in 1906 in honor of Sir William Perkin and one of the highest honors in chemistry,



The Institute's 115-foot engineering model of the Cape Cod Canal is now complete and studies of the tidal currents in the waterway are progressing. This bird's-eye view shows the canal and its approaches. In the background is Cape Cod Bay, while in the foreground Buzzard's Bay, with its many islands and bays, is spread out in scaled detail. The channel of the old canal is discernible winding across the far side of the bay and disappearing in the reflections of the windows. The dark line crossing the middle of the bay and cutting through an island marks the route of the deeper and wider canal now under construction. Along the course of the canal proper are the instruments for measuring tidal effects



Flutter of a model airplane wing studied in an Institute wind tunnel. The Department of Aeronautical Engineering utilized the Edgerton high-speed photographic technique to obtain a visual evidence of wing behavior at high speeds. Safety in the air is being increased by fundamental research such as this. Note the amplitude of the wing's vibration

is presented by the American Section of the Society of Chemical Industry. Those who have received it in the past include Willis R. Whitney, '90, the late Arthur D. Little, '85, E. G. Acheson, and Leo H. Baekeland. Dr. Lewis, distinguished for his contributions to research in industry, particularly in the fields of leather and petroleum, is an honorary member of the British Institution of Chemical Engineers and has been active in the Division of Industry and Engineering Chemistry of the American Chemical Society.

Rowe Memorial Regatta

A NEW intercollegiate Henley regatta, named in honor of the late Dr. Allan Winter Rowe, '01, has been announced by the Technology Athletic Association, and Yale and Syracuse University have accepted invitations to race with M. I. T. on Lake Quinsigamond at Worcester, Mass., on April 25.

The new event in rowing is open to all college members of the American Rowing Association, and a trophy to be known as the Rowe Memorial Cup has been presented to the M. I. T. Advisory Council on Athletics by Charles Hayden, '90, of New York, to be placed in perpetual competition.

As a member of the Institute's Corporation and as Secretary of the Alumni Advisory Council on Athletics, Dr. Rowe encouraged sports at Technology for years and gave much thought to the development of rowing. He believed that Lake Quinsigamond, sheltered from high winds by the surrounding hills and narrow enough to give spectators unusual opportunities for watching races, was an ideal course. Yale and M. I. T. have raced there the past two years. It had long been Dr. Rowe's hope that an intercollegiate regatta would be established on the lake and he was active in planning such an event up to the time of his death in December, 1934.

Members of the M. I. T. Athletic Association and the Alumni Advisory Council on Athletics took up the plans after Dr. Rowe's death and, following consultation with Malcolm Farmer, Director of Athletics at Yale, presented them at the autumn meeting of the American

Rowing Association in New York. M.I.T. was authorized at that time to prepare rules for the new regatta and submit them to members of the Association.

The first regatta in April will bring eight crews to Lake Quinsigamond. M.I.T. and Yale will send their Varsity, Junior Varsity, and 150-pound crews, while Syracuse has entered her Varsity and Junior Varsity boats.

The formal terms of agreement provide that the regatta be held on Lake Quinsigamond, or any other course chosen by the M.I.T. Advisory Council on Athletics, and that the date be sent at the autumn meeting of the American Rowing Association. It is also required that there be a minimum of three competing colleges to warrant award of the cup. At least two of the colleges must be represented by Varsity, Junior Varsity, and 150-pound crews, while the third must enter any two of these crews.

The point system for the regatta gives the Varsity crews ten points for first place, six for second, and three for third place, the fourth place not counting. Junior Varsity crews will be given eight points for first place, five for second, and two for third. The 150-pounders will get six points for first, four for second, and one for third.

The college winning the greatest number of points will be the winner of the regatta and will hold the Rowe Memorial Cup for one year. In the event of a tie, if one of the competitors has won first place in the Varsity race, that college shall be declared the winner. Should this provision fail to break the tie, then a competitor who has won first place in the Junior Varsity event will be the winner.

The Rowe Memorial Cup presented for competition in the regatta is a magnificent specimen of English silver. It was made in London in 1822 and is heavy gold-plated sterling.

HIGHWAYS ON THE MARCH

(Continued from page 140)

multiple-lane, express roads with overpasses and are part of a general plan to connect the extreme boundaries of the nation with high-speed roads. No horse-drawn vehicles are permitted upon them. At present a section from Turin to Brescia via Milan and Bergamo and another from Venice to Padua form a large part of a route that is planned to extend from Genoa to Trieste. This road is paralleled by a high-speed truck and trailer road connecting Genoa with the great industrial cities of Milan and Turin, a road completed as far as Serravalle. Other completed *autostrade* join Rome with its port, Ostia, Naples with Pompeii (as a link in a highway destined to reach Amalfi) and Sorrento and Florence with Viareggio *en route* to the coastal resorts.

The *autostrade* have been built by a semiautonomous corporation, the *Societa Anonima Puricelli* (Signor Puricelli is the great Italian advocate of international highways), with varying degrees of financial assistance from a government which will ultimately own them. Tolls are charged. Unfortunately tourist trade thus far has not been sufficient to make the roads profitable, and sorely-pinched natives have been quite willing to use the slower but free state roads. Hence the program for

November Council Meeting

PRODDED by a list of 19 moot points submitted by last year's Alumni Day Committee, the Alumni Council at its 183d meeting on November 25, momentarily pulled itself together and showed that it could still, with forensic give and take, perform, albeit wanly, its deliberative function. With most of the talk emanating from the Class of 1917, the Council seemed to feel that:

1. Alumni Day should continue to be scheduled on Monday before graduation, rather than on Saturday;
2. Departmental seminars should be repeated;
3. There should be an all-inclusive luncheon.

The Council voted favorably on a recommendation of its Executive Committee that the Committee on Assemblies should deal with all gatherings exclusive of Alumni Day, and that each year the president of the association should appoint a special Alumni Day committee.

Upon the Council's acceptance of the recommendation, President Moreland announced the appointment of H. B. Richmond, '14, as chairman of the 1936 Alumni Day Committee. The Council, with marked enthusiasm, voiced its approbation. Mr. Richmond can certainly feel, as a result, that he has a unanimous vote of confidence.

The featured speaker of the evening was Professor K. C. Reynolds, '25, who spoke of the model studies of the Cape Cod Canal now being made at the Institute (see page 150).

Subsequent to the Council Meeting the Reunion Committee fixed the date of Monday, June 8, 1936, for the next Alumni Day.

autostrade is practically at a standstill and there is little likelihood of its pretensions being fulfilled in any near future.

GERMANY

It has remained, then, for Germany to plan and carry out a truly magnificent program of national express highways. The *Reichsautobahnen* have been widely advertised in this country (see *The Review*, January, 1935, page 130) and perhaps need little description here. Suffice it to say that the thorough-going Teutons have developed a scientific national four-way express system — dodging cities, passing local roads on different levels, provided with stations for gas and refreshment, deliberately curved at intervals to stave off driving fatigue, provided with luminous strips in the center to aid on foggy nights, planted to cut out headlight glare and enhance natural beauty. The system has five great links more than half of which will, at the present rate of progress, have been completed in 1936. One, connecting the North Sea and Baltic ports with Basel, will be finished as far south as Frankfurt in that year; a second, from Innsbruck and Munich, through Leipzig and Berlin to Stettin and the Polish border, and a third, from Aachen in Belgium to Posen in Poland, Saarbrücken, Weimar, and Dresden to Gleiwitz in Silesia, will be

finished; a fourth shows less progress; while a fifth, from Saarbrücken to Stuttgart and Salzburg, will also be completed. The most casual glance at a map of Germany will show that the strategic value of these roads cannot be overlooked.

Although the world may suspect the military motive in every German act, the plan is most remarkable in its careful consideration of many other factors: the scientific study of competition between rail and motor under a unified control; the utility of the system in furthering a large-scale plan for redistribution of industrial populations; the amount of unemployment relief furnished. As an economic project standing on its own feet, as an example of fact-facing bookkeeping, the *Reichsautobahnen* are perhaps less admirable.

OTHER FOREIGN ROADS

In the Old World, the long discussed Highway Number 1 from London to Istanbul is progressing, as a result of a series of September agreements reached by the nine nations involved in Budapest. The road from London to Dover, from Calais to Nuremberg, from Nuremberg to Vienna of varying degrees of excellence is, nevertheless, satisfactory throughout. In the Balkans, as in Central America, difficulties arise. Central European and the Balkan States have good roads near their cities but these soon degenerate into dusty or muddy cart tracks, often fording rivers. Road building or reconstruction has already begun in Yugoslavia, Bulgaria, and Rumania, each of whose governments has made substantial appropriations.

Naturally, road building might have been done without an agreement, but it can now be undertaken with the assurance that at a boundary town it will meet a continuation, that customs arrangements will make traffic easier, that signs will be standardized over the entire 2,000 miles, and that interpreters and guides will be available at each frontier.

It is expected that by 1938 a motorist will be able to leave London with one set of customs papers and motor to Istanbul or Constanta in five or six days without meeting dust or mud on the way. Only psychic difficulties and perpetual European war clouds stand in the way of the completion of this civilizing project.

Elsewhere the same ferment manifests itself. There is a road in Iraq along the Mosul pipe line; the French plan a motor tunnel under Mont Blanc; the Spanish-African vehicular tunnel is still discussed; the British talk of an all-red Cape-to-Cairo route; success in the first plans for Highway Number 1 already have led to further plans to extend the route to Damascus, India, and Cape Town. The world is highway mad.

THE AMERICAS

Meanwhile in this country there has been talk of an express highway to stretch from New York to San Francisco with forks in the East and West to other important cities. This plan, originally presented to Congress in 1928 by the late T. Coleman duPont, '84, has been frequently urged on Secretary Ickes by the Pittsburgh Chamber of Commerce. As projected by its present sponsors the road would have two 45-foot strips divided by a central curbing, each strip to be divided

into fast and slow lanes. Movement from one to the other lane would be handled by light control; there would be grade crossings as the road would not touch any major city directly; the road would be as nearly straight and level as topography would permit; the surface would be concrete.

The plan contemplates tolls of about one dollar per hundred miles of passenger-car travel to guarantee a self-maintaining, self-liquidating system. On such a toll basis, every 100 miles of road would have to carry 5,000 cars in an average 24 hours. One who has motored, say from Rapid City to the Big Horn Mountains, and seen less than 100 cars in a day may wonder where this volume will come from in the West; while those who now enjoy the high-speed systems of each coast without any direct charge might find little reason to pay for slight advantages. Hence, valuable as such a highway might be to the nation, it seems at the minute to be more a dream than a possibility—for the present, a creation of paper and pencil rather than of steel and concrete.

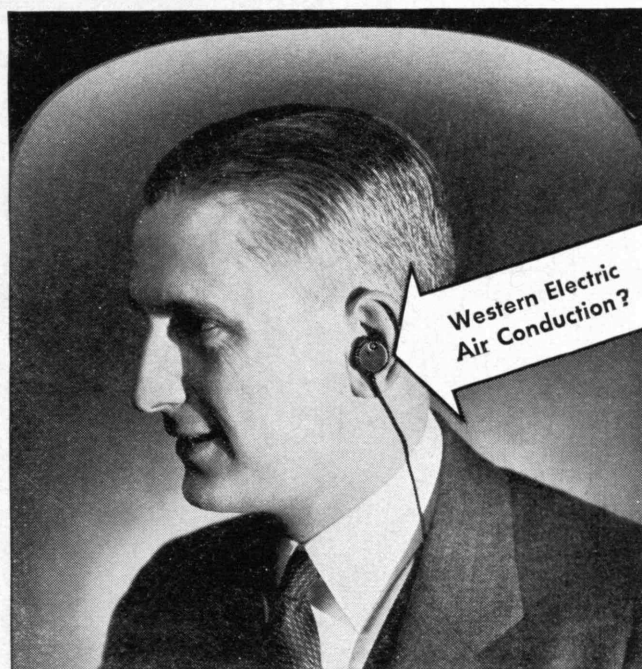
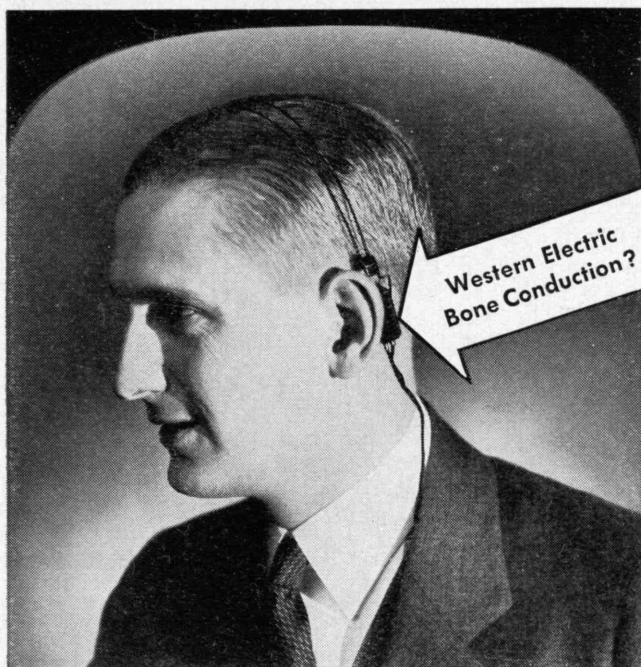
Less pretentious, but highly significant to the people of Canada, is the announced intention of that nation to complete a transcontinental system within its own boundaries. For all these years the Canadian westward-bound has found a gap in his system between Hearst or Sault Ste Marie and Schreiber about midway on the north coast of Lake Superior. The Ontario government is already accepting bids for building 105 miles of highway eastward from Schreiber to White River. The remaining link will be made as soon as it can be decided whether to connect White River with Hearst to the north or Sault Ste Marie to the south. The former route would be better for opening up farming and mining communities, the latter for tourist purposes.

When these two links are completed, Canada will have a 4,500-mile transcontinental highway entirely of gravel surface or even better top, from Halifax to Revelstoke and Golden. Plans for this section have not yet been laid.

Meanwhile, to the south of us, the Republic of Mexico has, perhaps, made the outstanding highway development of all nations, if one considers her size and her wealth. In the past, her communication problems have been almost as severe as China's. The pioneers established little more than trails. There were, to be sure, a few cobbled roadways in Morelos, but the main activity was desultory. After the war with Spain in 1821, bankrupt Mexico had to let her highways go altogether, but she did make one supreme effort and built a railroad. She is now stimulated to a new and great endeavor and her present elaborate plan is level-headed, a part of her serious effort to obtain the full goodwill of her large northern neighbor.

After building two hard-surfaced roads as spurs from the City of Mexico to Puebla and Pachuca, Mexico started on her first great link, the 800 miles from Nuevo Laredo opposite Laredo, Texas, to Mexico City. By precarious blasting on precipitous mountain sides (see pictures, page 140), work in devastating tropical heat of the valley between Tamazunchale and Valles in an atmosphere of poisonous, stinging insects, deadly reptiles, and malaria, a road was (*Continued on page 160*)

Which type of **HEARING AID** *is better for you?*



Try both before you decide!

Some people find a bone conduction hearing aid is best for them. For others, the air conduction type makes hearing easiest. Western Electric offers both types—urges that you try both and decide which is better for *you*.

The Audiphone transmits sound so *clearly* because it was developed by sound experts at Bell Telephone Laboratories. Latest improvements can be added to instruments now in use—thanks to the Audiphone's unit design. Try the Audiphone—hear the difference for yourself!

Western Electric
• HEARING AID •

Distributors in Canada: Northern Electric Co., Ltd.

Consult telephone directory for address of Graybar branch in your city, or mail coupon to Graybar Electric Co., Graybar Building, New York, N. Y., for details on Western Electric Audiphone and name of nearest Audiometrist.

AL-19

Name.....

Address.....

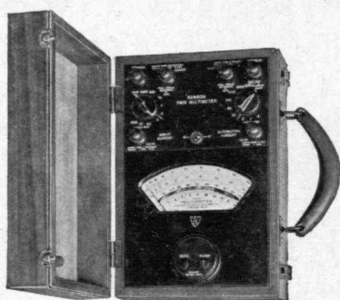
City.....State.....

RAWSON TWIN MULTIMETER

29 ranges in less space than any near equivalent combination — size 12" x 8" x 6"

Range of measurements

D.C. 1 microampere to
1 ampere
20 microvolts to
1000 volts
A.C. (up to 3000
cycles)
2 milliamperes to 3
amperes
60 millivolts to
1000 volts



List Price \$165.00

The Rawson measuring instruments are the only ones having two pivot movements whose weight is lifted from jewels when clamped for transit. Electrical clamping does not accomplish this purpose.

Special apparatus built to order

RAWSON ELECTRICAL INSTRUMENT CO.

110 Potter Street

Cambridge, Mass.

Branch: 91 Seventh Avenue, New York City

Representative: E. N. Webber, 1217 Washington Blvd.,
Chicago, Ill.



AUTOMOTIVE AND AIRCRAFT CABLES

Lighting, Starting, and Ignition Cables and Assemblies.

POWER AND LIGHTING WIRES

Solid, Stranded, Flexible, and Extra flexible conductor in three grades: — National Electric Code, Intermediate, and 30% rubber insulation.

Weatherproof or Flameproof finish.

ELEVATOR CABLES

Control, Annunciator, Lighting and Telephone.

FLEXIBLE CORDS

Lamp cords in various types and heater cord.
Radio wire and special radio cables.
Heat resisting fixture wires and Asbestos Stove Wire.
Plain rubber sheath portable cord for garages, portable tools or appliances.
Extra flexible cord for fans and magnetic or mercury switches.

SPECIAL SERVICE CABLES

High voltage cables for Neon sign, Oil burner ignition, Static neutralizers, Heavy current cables for Battery charging, Welding, Mining and Moving picture machines. Cables made to order for particular use.

For thirty years manufacturers of high-grade rubber covered wires and cables

**BOSTON INSULATED
WIRE AND CABLE COMPANY**
BOSTON, MASSACHUSETTS

TRAINING FOR PUBLIC HEALTH ADMINISTRATION

(Continued from page 143)

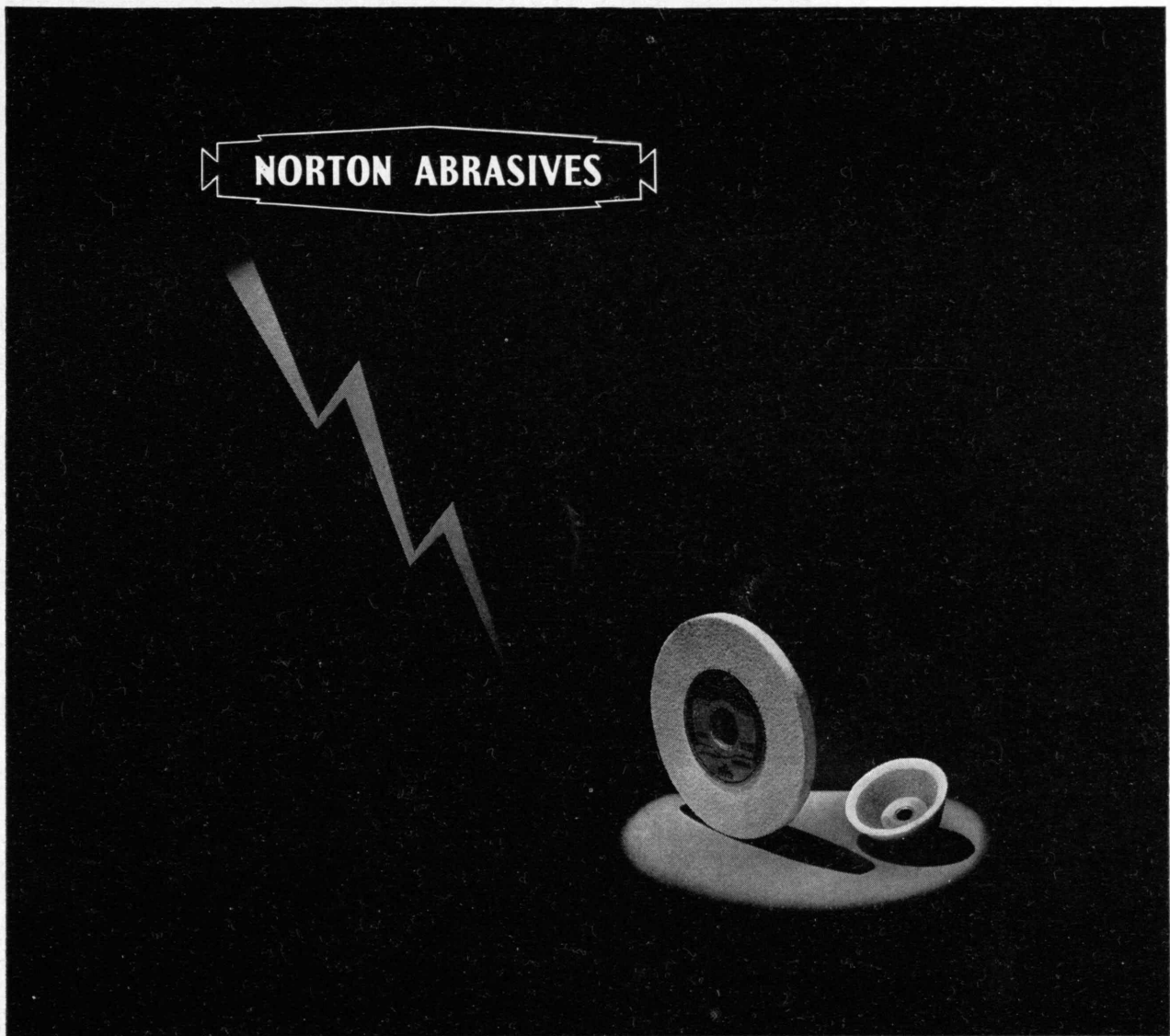
pasteurization of milk supplies, the control of carriers, and the use of vaccinal prophylaxis. Similarly, the control of malaria, yellow fever, hookworm, and other environmental diseases is not essentially a medical problem, but is rather an engineering task. The protection of milk and other food supplies is again an engineering undertaking, and thus certain important communicable diseases like diphtheria, scarlet fever, undulant fever, septic sore throat, and tuberculosis have been brought under more effective control. In the case of smallpox and diphtheria, prevention has been accomplished by prophylaxis rather than by medical treatment. Even in the control of infant and child mortality, the progress has been the result of health education, better personal hygiene, more adequate nutrition, as well as improvement in the safety and quality of our milk supplies. The more purely medical aspects of maternal and child welfare work have not shown similar improvement, as a review of the statistics pertaining to maternal mortality, stillbirths, and neonatal deaths will disclose.

It would be possible to expand the brief for the non-medical public health worker at much greater length, but it is hardly necessary. Enough has been said already. Suffice it to say that the properly trained non-medical public health worker is a highly professional individual, with a background of training as exacting as that pursued by the physician. It is also true that effectiveness in administration is not a quality found exclusively among physicians. Successful administration requires knowledge, tact, personality, common sense, and the ability to organize and direct subordinates and resources. Ability to serve as a leader and an educator in the community is also essential. These are qualities found in all walks of life, and experience teaches that the scientific knowledge demanded of public health administrators is found among nonmedical as well as among medical sanitarians.

It would be a simple matter to prepare a long list of highly qualified, expertly trained public health employees in the United States today — from the fields of public health administration, public health engineering, public health laboratory service, public health education and vital statistics — who are not physicians and who would be adversely affected by the report of the Committee on the Professional Training of Health Officers if it should become a part of our national policy. These men would be doomed to positions subordinate in administrative responsibility to those possessing the medical degree even though they may be superior in professional training, achievement, and those personal qualifications essential for success in any administrative position. Such injustice should, therefore, not be tolerated, and it is imperative for the nonmedical professional groups in this country to make their position known, and, if necessary, to organize the opposition.

Emphasis in the professional training of public health administrators should be placed on the adequacy of their training in the principles and practices of public

(Concluded on page 156)



The first major Norton contribution:— Electricity creating an inferno in the arc furnace, 3700° F. protected by a Norton-invented water-cooled shell, fusing nature's aluminum oxide — gave to the industrial world the abrasive trademarked Alundum.

For exactly fifty years, Norton Abrasive research has carried on, Norton scientists solving vital problems of workers in iron, steel and other metals. They have created GRINDING WHEELS for thousands of operations, for use in a million ways.

Scientific grinding has made possible the use of new, harder alloys so necessary to modern high production machines.

Norton designers have produced grinding machines that have raised machining standards — and grinding standards are measured in tenths of a thousandth.

It is largely because of the fifty years of Norton research that Norton Abrasives are serving so well the world's industries.

Industry should look to "Norton" abrasives.

NORTON COMPANY, WORCESTER, MASS.

Behr-Manning, Troy, N. Y. (Division of Norton Co.)

Coated abrasive paper and cloth

Norton Abrasives—Oilstones and Abrasive Specialties

for 1936 . . . and Beyond

Accurate—Dependable—
Cost-Cutting Equipment for a
wide variety of requirements
for the Toolroom and Manu-
facturing Depts.

CONSIDER — not only
the improved production and
accuracy possible by installing
this modern equipment today
— **BUT** — the long service
that insures profitable returns
on the investment.



— A Broad Range
of Types and Sizes
of Machine Tools —
Milling—Grinding
—Gear Cutting and
Screw Machines.

*The No. 140 Catalog
lists the full line. Have
you a copy?*

*Brown & Sharpe
Mfg. Co.
Providence, R. I.*

BROWN & SHARPE

ANHYDREX RUBBER INSULATION FOR WIRES AND CABLES

With ANHYDREX insulation, lead sheaths and other metallic coverings may safely be omitted from submarine or underground power cables thereby doing away with the possibility of electrolysis, chemical corrosion, crystallization and sheath currents. ANHYDREX does not absorb moisture. It has the electrical properties of high grade rubber and is impervious to moisture.

*Ask for descriptive booklet entitled "ANHYDREX
Rubber Insulation for Wires and Cables."*

SIMPLEX WIRE & CABLE CO.

79 Sidney Street, Cambridge A
BOSTON, MASS.

TRAINING FOR PUBLIC HEALTH ADMINISTRATION

(Concluded from page 154)

health regardless of any other training which the individual may possess. While it is true that a medical degree may be advantageous to a health officer, it must be admitted simultaneously that similar advantages would result from other types of professional education, such as engineering, law, sociology, government, and so on. The health officer must necessarily draw on the knowledge and experience of all the disciplines involved. It is unwise to say that he must be first a physician, or an engineer, or a lawyer, or anything else. The important requirement is that he should be trained in public health principles and practices. Beyond that we cannot and should not go. As a matter of fact, the physician who is trained to think of health in terms of the individual rather than in terms of the community often does not possess the broader community point of view which the public health engineer must of necessity possess. There are, however, capable public health administrators who are physicians and there are others who are not physicians. The public health of the United States has progressed to its present high degree of excellence under such an arrangement. Its future will best be served only if the various professional groups involved coöperate to the fullest degree possible and if the best qualified personnel are permitted to exercise administrative responsibility regardless of the possession or lack of a medical degree.

THE FUTURE OF ALLOY STEELS

(Continued from page 146)

New combinations within the S.A.E. group may be anticipated within the decade, and these will be based on chromium, nickel, molybdenum, and vanadium, with silicon playing a more important rôle as a modifying element and manganese running up to 1%. The sharp lines between the various S.A.E. steels will be broken down. Already we have the 3,100 series with molybdenum, the 4,100 series with nickel, and the 4,600 series with chromium. As yet, the 6,100 series has not been commercially modified to any great extent, but if one were to venture a guess as to the nature of the most popular S.A.E. steel in 1944, chrome-vanadium 6,100 modified in a manner suggested by the above thoughts might well be correct.

With increased use of automotive equipment not only on the highway but also on the farm, a normal growth in the already well-developed S.A.E. type of steel is to be expected, but this increase will probably not be of the same order of magnitude as the two other categories here reviewed.

Since the initial commercial development of stainless steel (approximately 1914) when it was applied in cutlery, enormous commercial development has been under way. The work of Becket, Haynes, Hatfield, and John-

(Continued on page 158)

ESTABLISHED 1818

Brooks Brothers,

CLOTHING,

Gentlemen's Furnishing Goods,

MADISON AVENUE COR. FORTY-FOURTH STREET
NEW YORK

Overcoats at Brooks Brothers

THE BROOKS ULSTER just introduced . . . a long double-breasted coat falling 10 to 12 inches below the knee, in bold over-plaid Scotch Cheviots. THE DORSET, a fly-front model with notched lapels . . . entirely suitable for both town and country. THE SALISBURY . . . double-breasted with long sweeping lapels and fitted at the waist, for general wear. THE CHESTERFIELD . . . conservative and useful as ever. Others ranging from English Covert Cloth to Harris Tweeds lined with muskrat or wallaby.

Overcoats \$58 to \$110

Fur Coats \$160 to \$500

BRANCHES

NEW YORK: ONE WALL STREET

BOSTON: NEWBURY COR. BERKELEY STREET



INFORMATION ON M. I. T.

THE TECHNOLOGY REVIEW BUREAU exists to supply authoritative information to anyone interested in details regarding the Massachusetts Institute of Technology. It serves as a clearing house for inquiry and aims to further the spread of exact information regarding entrance requirements, outline of courses, subjects of instruction and other information which may be of aid to the students considering undergraduate or graduate study at the Institute.

The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

Ask for the following pamphlets by their descriptive numbers

1: For general information, admission requirements, subjects of instruction, ask for Bulletin 1.

2: For announcement of courses offered in Summer Session, ask for Bulletin 2.

3: For information on courses in Architecture, both Undergraduate and Graduate, ask for Bulletin 3.

4: For a popular presentation of Educational Opportunities offered at M.I.T., ask for Bulletin 4.

All inquiries sent to the address below will receive prompt attention

THE TECHNOLOGY REVIEW BUREAU

ROOM 11-203, MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MASS.

THE FUTURE OF ALLOY STEELS

(Continued from page 156)

son as well as that of the Krupp organization has contributed greatly to the new development, and, since the World War, the large-scale production of the plain chromium steels, as well as the austenitic chromium steels containing nickel, has been established in all major countries. Today, the stainless steels not only give cutlery which will retain its edge, but also fill the need for an ornamental surface which will stay bright under atmospheric conditions, and, in addition, they find manifold applications in the chemical industry. As in all new steels of the complex high-alloy type, many special metallurgical problems arose in connection with the high chromium group, both the plain chromium ferritic type and the austenitic type. These problems have been attacked individually, and many solutions have been achieved, so that today we have available plain chromium steels of relatively high ductility as well as new austenitic types which are practically foolproof from the standpoint of fabrication, welding, and the like, and which, when used with proper understanding, result in resistance to various media of outstanding order of magnitude. Several modifications of the high chromium steels are in vogue. The use of copper in plain chromium types, the use of molybdenum both in the ferritic and the austenitic types, and the use of silicon in either of these deserve mention. Probably the outstanding development has been the introduction of carbide-stabilizing elements

into both the ferritic and the austenitic high-chromium materials. Titanium stabilizes the carbide to an appreciable degree, and columbium provides practically complete stabilization. Thus, with the new columbium steels the problem of intergranular corrosion of the austenitic types, as well as the problem of air-hardening of the ferritic types, is definitely solved and ceases to be cause for concern. The use of high-nitrogen ferrochromium in the ferritic types is another of the outstanding recent developments, providing grain-size control in the ferritic chromium steels, particularly in those with more than 20% chromium and those used in the as-cast condition. Another development which has received less attention in this country is the chromium-manganese-copper ferritic-austenitic steels. These steels have many of the advantages of the 18% chromium-8% nickel type and certain other advantages in the fabrication, particularly where hot working is involved. Any thought as to the future of stainless steels would be incomplete if this group were not mentioned.

The improved stainless steels have been readily accepted by the public. Their advantages are well understood, although occasionally the materials are misapplied with disastrous results. As knowledge regarding the proper use of these steels increases, such misapplication should become a rarity, and as we gain in experience the true field of these steels in the chemical industry, transportation and architecture will be more clearly delineated.

With all of the above-mentioned excellent characteristics, corrosion resistance being the foremost, and with freedom from some of the troubles which have limited their progress in the past, the only remaining deterrent to the wide consumption of stainless steel lies in the final cost. This depends not only on the cost of the alloying constituent, but also on the cost of finishing the product with almost perfect surface. It has been stated recently that a yield of 50% from ingot to sheet or other final product is the rule, rather than exception, in the production of stainless steel. With better melting practice, improvement in heating and rolling equipment, and increase in specialization in the production of these steels we cannot help materially increasing this yield. This, together with improved methods of obtaining satisfactory surface, should result in appreciable reduction in the cost of the finished stainless-steel product within the decade.

Technology Alumni . . .

JOIN THE MARCH TO WALKER MEMORIAL

THE number of alumni functions, undergraduate dances and dinners held in Walker Memorial has increased from 185 in 1927-1928 to 687 in 1934-35, or 371 per cent; number of guests attending from 12,832 to 47,493.

Your class smoker or dinner will receive the same courteous reception which has resulted in this phenomenal growth of Walker Memorial as a social center for all Technology men.

MENUS SUBMITTED ON REQUEST

Address A. W. BRIDGES
WALKER MEMORIAL DINING SERVICE
M. I. T.
Cambridge, Massachusetts



Industrial and Automotive Brake Lining
and Clutch Facings—Rubber Belting
—Hose—Molded Goods—Packing—
Rubber Rolls and Abrasive Wheels.

THE MANHATTAN RUBBER MFG. DIVISION
OF RAYBESTOS-MANHATTAN, INC.
EXECUTIVE OFFICES AND FACTORIES, PASSAIC, NEW JERSEY

Perhaps the only safe guess as to the composition of stainless steels in 1944 is that they will contain more than 11% chromium. In fact, this is the one prediction that looks like a 100% sure thing. To leave this safe ground, however, the 1944 stainless steel will contain columbium, and this element in the future may be as synonymous with nonhardening stainless steel as carbon is with tool steel. The ferritic steels should find still greater favor with chromium at 20%, and the austenitic steels of the 20% to 10% type rather than 18% to 8% will be the blue chip of the series, with the ferritic-austenitic steels making their own place in the picture. The 12% chromium ferritic steels should be due for a great expansion in special engineering service, with specifications on quality of surface markedly reduced.

To summarize, we have with us at the moment a rapid development in as-rolled structural alloy steels, a relatively stable situation in the alloy engineering and automotive steels, and a situation ripe for new development and expansion in stainless steel. This would tend to lend some justification to the highly speculative prophecies for enormous tonnages of alloy steels in the not too distant future. Let us content ourselves, however, with the simple prediction that alloy steels in the decade will become a major item even in the large-tonnage steel maker's portfolio, and that, together with carbon steels, they will increase the total steel consumption and effectively combat ever-present attempted inroads of nonmetallic and nonferrous products.

MAIL RETURNS

(Concluded from page 126)

relation of which Dr. Horton writes especially has come to be viewed with less and less of the dualistic contradiction that belonged to the Cartesian doctrine as a whole. One must not overlook the fact that the philosophy of Descartes, as stressed by the article in "Larousse du XX^e Siècle," more than any other system, was a philosophy of freedom. The Cartesian soul was free to make its own decisions, as Diety was free to ordain the laws by means of which the natural world was ordered and sustained.

So far as psychology has striven to pattern its method upon a mechanistic view, to that extent it has suffered from historical lag. But this dead weight which held it back was borrowed from the materialistic viewpoint that dominated the sciences toward the close of the last century. In striving to become scientific, psychology climbed onto the materialist band wagon about half a century too late; today its automation campaign songs are as out of date as the costumes of the Gay Nineties.

Evolution, as now more and more generally conceived, is not so much an unrolling and a building-up process, not so much a question of descent as of ascent, with a strong tendency in many quarters to consider more carefully the explanatory theory of Lamarck as more faithful to life than that of Darwin and his more rigid successors. The Gestalt school of psychology, which borrows the concept of fields of force from physics, in order that it may assimilate the precision of the physical sciences, tends to beg the question; since it is a *non sequitur* that physics is identical with science. The circumference of science is broader than that of physics alone.

It is true that psychology needs to make up for its historical lag. It is also true that it may best hope to do so, not by catching on to the coat tails of scientific notions that are now speeding toward oblivion, but rather by seeking to find within itself that freedom, that faith in liberty, without which mind is but as a sack of meal bound to the back of the galloping horse of physicochemical bodily action and reaction.

By all means let us have a Mentarium. It will help us not only to know our mechanisms, as Dr. Horton suggests, but also to know the historical lag latent in all mechanistic concepts of the materialist brand.

Should Engineers Buy STOCKS?

M.I.T. twenty-two years ago established Course XV. The Institute then recognized that Business Administration is of vital importance to engineers.

We now ask another question: Has the time come when engineers should inform themselves on the more efficient control of investment funds?

Both as individual investor and professional consultant, a *fully* equipped engineer should master the *fundamentals of finance*.

Believe it: Not a wheel can turn or even a pencil move on the board unless the necessary funds are put up by bondholders, stockholders, — or tax payers!

Is not an engineer too narrow a specialist if he lets himself become so absorbed in construction and production data that he loses intelligent contact with the "end figures", which are FINANCIAL.

Certain fundamentals of investment — like engineering — can be secured only through employing experts. We should like to bring to your attention certain basic principles acquired over more than thirty years of practical experience.

Good engineers should be good business men, and for you we have a booklet entitled "Should Business Men Buy Stocks?" Many who may have felt that the purchase of stocks means dabbling in the market have gained new respect for the subject after reading this report. A copy will be sent to you gratis on request.

Babson's Reports

DIV. 15-114, Babson Park, Mass.

Send gratis your booklet entitled "Should Business Men Buy Stocks?"

Name

Address

.....

HIGHWAYS ON THE MARCH

(Continued from page 152)

hacked through the jungle vastness. By 1930, 93 provisional bridges or culverts of bamboo had been thrown up in one short area of 31 miles; by June 1931, all these but one had been replaced by concrete masonry and steel. The final blast was made near Chapalhuacán in April 1931 and a road, of a sort, was opened to traffic. Today the road extends from Mexico City to the border, although certain parts of it, particularly in the South, will still present difficulties for the motorist.

The Mexican plan contemplates carrying the road south from Mexico City to the border of Guatemala. The difficulties in the South are greater even than those already surmounted but there is reason, in view of the past, to think they will be overcome. The route has been definitely fixed as far south as Tehuacan, a distance of 200 miles, and the general route is known from there to Mitla, another 200 miles. Below Mitla even a trail is intermittent and the 500 miles to the Guatemalan border will be a matter to test endurance.

This highway across Mexico forms a part of one of the two great international proposals: the Pan American highway, to which must now be added the Alaskan highway. These routes have been the subject of numerous conferences and are on the way to realization. When completed, they will link Fairbanks in Alaska with Montevideo and Buenos Aires.

The Alaskan road may be the last link in the route, for most of the new construction is in Canada, although the former may be expected to reap the greater benefit. In general it will run east of the watershed, although this is less scenic than the western route, to avoid glaciers, rapid streams, and the relatively high rainfall of the western slope. By joint effort of the governments it has been completely reconnoitred by air and pack train. The principal difficulties will be the unbroken wilderness, innocent even of trails between Stikine and Atlin, the swift river crossings of the Yukon, and the 3-to-8-foot snow fall of a severe winter. It is expected, however, that normal winter maintenance will permit necessary travel all winter, and a tourist season of five months is predicted. The road will be narrow and of graded earth, to be improved as occasion demands. No definite steps have yet been taken for its completion north of Hazelton, B. C., which can now be reached by motor from Vancouver or Seattle.

The Central American section of the highway has been completely reconnoitred and planned as a result of a series of conferences beginning in Santiago in 1923. The nations immediately began comprehensive programs which have been seriously interrupted by depression-poverty. Through Panama the road is complete; Costa Rica and El Salvador have the work well in hand. Guatemala and Honduras can be expected to




SUPPER ROOM
DINNER and SUPPER DANCING
Music by
HOWARD LALLY and his
Famous "Roberta" Orchestra
SPARKLING ENTERTAINMENT

Large, comfortable, airy rooms for single or double occupancy at moderate rates

THE BILTMORE... MADISON AVE. AT 43RD ST., NEW YORK

Reservations
MUrray Hill 2-7920
Room 100





Transits and Levels are used on all largest works and by U. S. Govt. for utmost precision.
New catalog, just issued, sent gratis
BUFF & BUFF CO. Boston 30, Mass.
Handsome nickel bas-relief of a Buff Transit sent gratis to engineers

WILLIAM P. BERKELEY

M. I. T. '27

*Equitable Life Assurance Society of
the United States*

100 Milk Street, Boston

Room 1022

Hancock 6200

MORNING FACE IN THE BERKSHIRES

A small boarding school for boys and girls from four to fourteen. Prepares for leading secondary schools. Men and women teachers who understand children. Intimate home life.

for information address

MRS. ELEANOR RUNKLE CRANE, Director, Richmond, Mass.

A Book for HYDRAULIC ENGINEERS

Centrifugal Pumps, Turbines, and Propellers by Wilhelm Spannake, translated from the German by John B. Drisko. Pp. xiv + 328, 182 illustrations. \$5.00.
"This book is a valuable addition to the English textbooks in hydraulics." — Power Plant Engineering.

THE TECHNOLOGY PRESS
M.I.T., Cambridge, Mass.

make reasonable progress, but Nicaragua, not yet recovered from the 1931 Managua earthquake, will, perforce, lag.

The road to Panama has been reconnoitred. In general it will follow the western and drier side of the Cordillera. Uniform gradients, tangents, and widths have been established. Except in Guatemala, where it frequently climbs above 10,000 feet, it is not a particularly high-level route. It will, however, tap magnificent scenic and hunting preserves. It will permit real agricultural development in products which we ordinarily think of as coming from the East but which can be abundantly raised in Central America — products like tea, cinnamon, quinine, rubber, copra, in addition to staples which we now obtain at high cost, such as, mahogany, coffee, chocolate.

A true inter-American highway should fork at Colon with an eastern road through Caracas, Cayenne, and Rio de Janeiro to Montevideo and a western road to Quito, Lima, and Santiago, coupled with a highway from Santiago to Buenos Aires and another through Sucre and Asuncion. Conditions in the East are, how-

ever, not favorable to any immediate progress. Ecuador, Venezuela, and Colombia have made magnificent strides and there is even now a fine highway from Caracas to Guayaquil essentially completing the inter-American highway for these countries. Venezuela, moreover, builds a road to Ciudad Bolivar, the first road to reach the Orinoco, a highway which will be carried to the Brazilian boundary. Brazil and the Guianas, however, cannot be expected to do much, if anything, in the next few years.

In the West, conditions are more favorable. Peru, with no very good or comprehensive highway system, makes slow advances. Chile has a passable road from the northern boundary to Valparaiso and Santiago which needs and gets much improvement. The road from Santiago to the boundary of Argentina is well improved, but is closed for several months in the year due to excessive snowfall in the high Andes. Argentina, since 1932, has made rapid progress and is surfacing the main road from Buenos Aires to the Chilean border via Mendoza. Finally, Uruguay, claiming the finest system in South America, has her reinforced- (*Concluded on page 162*)

PREPARATORY SCHOOLS FOR BOYS

BERKELEY PREPARATORY SCHOOL

Established 1907

Special Preparation for M. I. T.

Day School — for Boys: Evening Session — Coeducational

HARRY F. CADE, JR., '28, *Principal*

1089 Boylston Street, Boston

Tel. Commonwealth 9262

CHAUNCY HALL SCHOOL

Founded 1828. The School that confines itself exclusively to the preparation of students for the Massachusetts Institute of Technology.

FRANKLIN T. KURT, *Principal*, 553 Boylston Street, Boston, Mass.

HEBRON ACADEMY

Thorough college preparation for boys at costs surprisingly low due to endowment and country location. Graduates in 32 colleges. Experienced faculty of 15 men. Excellent dormitory, classroom, laboratory and athletic equipment. For book, "Building Scholarship," address

RALPH L. HUNT, *Principal*, Box T, Hebron, Maine

HUNTINGTON SCHOOL FOR BOYS

Five Forms. Special two-year course for entrance to M. I. T.

Summer Session (Co-educational)

Send for catalogues

CHARLES H. SAMPSON, Ed.M., *Headmaster*

320 Huntington Ave., Boston

Tel. Kenmore 1800

MOSES BROWN SCHOOL

An Endowed New England School with an excellent record in preparing boys for leading colleges. 25-acre elm-shaded campus. Athletic Fields. Gymnasium. Swimming Pool. *For Illustrated Catalog Address:*

L. RALSTON THOMAS, *Headmaster*, 257-A Hope Street, Providence, R. I.

NEW HAMPTON SCHOOL

115th year. A New Hampshire School for Boys. Six Modern Buildings. Thorough College Preparation. Junior Course in Business. Athletics for Every Boy. Moderate Tuition. *Address*

FREDERICK SMITH, A.M., Box 198, New Hampton, N. H.

NORTHWOOD SCHOOL

In the heart of the Adirondacks. Under Lake Placid Club Education Foundation. Unusual success in college preparation. Emphasis on recreation that can be continued throughout life. Winter sports. *Separate junior school for boys, 8 to 12.*

IRA A. FLINNER, Ed.D., *Director*, Box T, Lake Placid Club, N. Y.

ROXBURY SCHOOL

For boys 11 years and older

Flexible organization and painstaking supervision of each boy's program offer opportunity for exceptional scholastic progress and general development.

A. N. SHERIFF, *Headmaster*, Cheshire, Conn.

SHATTUCK SCHOOL

A Church school for boys. 75th year. Stands high among schools for sound scholarship, manly character and Christian citizenship. *Military training.* Sends boys to M.I.T. each year.

Address The Headmaster, Faribault, Minn.

WILLISTON ACADEMY


Unusual educational opportunities at modest cost. Endowment over half a million. Over 150 graduates in 40 colleges. New recreational center, gymnasium, swimming pool. Experienced, understanding masters. *Separate Junior School.* *Address*

ARCHIBALD V. GALBRAITH, *Headmaster*
Box 3, Easthampton, Mass.

COPIES
OF ANYTHING **LIBERTY 3000**

WRITTEN TYPEWRITTEN
 PRINTED
 PHOTOGRAPHED or DRAWN

SPAULDING-MOSS CO.
 REPRODUCTION SPECIALISTS
 42 FRANKLIN STREET BOSTON · MASS.



MERRIMAC CHEMICAL COMPANY

Subsidiary of Monsanto Chemical Company

EVERETT
 MASSACHUSETTS

*The largest and oldest
 chemical concern in New England*

Founded in 1853

THE RUMFORD PRESS

Concord, New Hampshire

1 1 1

*Makers of Magazines and Books
 of Distinction*

William H. Coburn, '11 John K. Phelan, '27 William F. Dean, '17

William H. Coburn & Co.

INVESTMENT COUNSEL

68 Devonshire St.

Boston, Mass.

HIGHWAYS ON THE MARCH

(Concluded from page 161)

concrete Colonia highway from Montevideo to Colonia where it connects with a 27-mile ferry to Buenos Aires. From Montevideo to the Brazilian border the road is passable but not very good. Paraguay and Bolivia, altogether exhausted by the long fracas in the Chaco, can do nothing, and Brazil seems uninterested. Nevertheless, despite the obvious gaps, the inter-American highway is on the march.

All these grandiose international plans for routes and grandiose national achievements in express roads tend to becloud the most significant road construction now going on. The American, drilling along on his four-lane roads, may hold *Reichsautobahnen* and *autostrade* in high esteem and the mud roads of China and Russia as of little account. But those long miles of mud and swirling, unbridged streams, of treacherous curves and blinding dust are more significant to world history than the thousands of tons of concrete being poured in Germany. In them lies the important element in humanity's expanding future.

TREND OF AFFAIRS

(Concluded from page 137)

impartial examination of information thus submitted, the application still stands up, the patent would be granted. This method would undoubtedly eliminate thousands of duplications and repatentings of old ideas, speed up motion through the Patent Office, and eliminate a large amount of patent litigation at the source.

A second recommendation is that there be established a special patents court, with the bench occupied by judges qualified in technology as well as in law, to give them better understanding of the questions before them and hence cleaner-cut and more decisive verdicts. Related to this is the further recommendation for the creation of a corps of specially trained advisers, whose knowledge and opinions would be available in the trial of patent cases.

The committee also considered the proposal that measures be taken to compel the licensing of all patents, but decided that such compulsory use of inventions would be contrary to the underlying theory of patents.

The classification of patents is recommended, so that elaborate and costly inventions such as flying machines might receive consideration and protection commensurate with the labor and expense put into their creation, instead of being on a par with simple things like collar buttons, as they are at present.

Among "minor recommendations" presented by the committee is a proposal that patent-office searchers be given opportunity to visit industrial plants all over the country, for their own better training. Another is that the present system of renewing patents be done away with. It is also recommended that an annual tax be placed on all patents, the amount to be increased each year. Patent taxes of this kind are used in certain foreign countries, for the purpose of eliminating dormant patents; for if the tax remains unpaid the patentee automatically loses the rights which he is not exercising.

PROFESSIONAL CARDS

JACKSON & MORELAND

Engineers

Public Utilities — Industrials
Railroad Electrification
Design and Supervision — Valuations
Economic and Operating Reports

BOSTON

NEW YORK

FAY, SPOFFORD & THORNDIKE

ENGINEERS

BOSTON, MASS.

BRIDGES

WATER SUPPLY AND SEWERAGE

PORT AND TERMINAL WORKS

FIRE PREVENTION

INVESTIGATIONS

DESIGNS

SUPERVISION OF CONSTRUCTION

H. K. BARROWS, '95

M. Am. Soc. C. E.

CONSULTING HYDRAULIC ENGINEER

*Hydro-electric developments — Water supplies. Reports, plans,
supervision. Advice, appraisals.*

6 BEACON STREET

BOSTON, MASS.

STANLEY G. H. FITCH '00

CERTIFIED PUBLIC ACCOUNTANT

of PATTERSON, TEELE & DENNIS

1 Federal Street, Boston, Mass.

Cost Accountants and Auditors — Tax Consultants

NEW YORK

BOSTON

WASHINGTON

REPRESENTATIVES IN OTHER PRINCIPAL CITIES OF THE
UNITED STATES, CANADA, ENGLAND AND AUSTRALIA

EADIE, FREUND AND CAMPBELL

CONSULTING ENGINEERS

110 WEST FORTIETH STREET

NEW YORK CITY

PLANS AND SPECIFICATIONS — EXAMINATIONS AND REPORTS

Power, Heating, Ventilating, Electric, Plumbing, Sprinkler, Refriger-
ating, Elevator Installations, etc., in Buildings and Industrial Plants

J. K. CAMPBELL, M. I. T. '11

MAURICE A. REIDY

Consulting Engineer

STRUCTURAL DESIGNS

FOUNDATIONS

CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER

Estimates and Appraisals

44 SCHOOL STREET

BOSTON, MASS.

BURTON W. CARY '08

MELVIN R. JENNEY '21

FISH, HILDRETH, CARY & JENNEY

Attorneys-at-Law

SPECIALIZING IN

PATENT AND TRADE-MARK PRACTICE

53 State St., Boston

Hubbard 2496

EVERETT E. KENT

PATENT LAWYER

*Patents, Trade Marks, Copyrights**United States and Foreign*

75 Federal Street, Boston

HUBbard 0234

ROBERT McC. SIMONDS

M. I. T. '24

Attorney-at-Law

PATENT PRACTICE
EXCLUSIVELY

120 Broadway
New York

THOMAS B. BOOTH '95

AMASA M. HOLCOMBE '04

EMERY, BOOTH, TOWNSEND, MILLER & WEIDNER

50 CONGRESS ST., BOSTON, MASS.

EMERY, BOOTH, HOLCOMBE & MILLER

MUNSEY BLDG., WASHINGTON, D. C.

PATENT LAWYERS

AN AID TO INDUSTRY IN LOCATING OUTSTANDING MEN

EMPLOYMENT SURVEY OF 1935 GRADUATES

An employment survey of the Class of 1935 shows that more than 84 per cent of the graduates are satisfactorily employed or carrying on graduate studies. The details of this recent survey, showing the present status of employment are tabulated below:

EMPLOYMENT SURVEY	<i>Awarded Doctors' Degrees in Science or Philosophy</i>		<i>Awarded Masters' Degrees in Science or Architecture</i>		<i>Awarded Bachelors' Degrees in Science or Architecture</i>		ALL GROUPS	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1935 GRADUATES								
Full Time Employment	33	91.6	107	75.4	265	69.8	405	72.6
Engaged in Advance Study . . .	1	2.8	21	14.8	45	11.8	67	12.0
Status Unknown	1	2.8	8	5.6	32	8.4	41	7.3
Unemployed or Part Time Employment	1	2.8	6	4.2	38	10.0	45	8.1
TOTALS	36	100	142	100	380	100	558	100

Of the 405 employed, 91.6 per cent report positions closely allied with their training at M.I.T.

**PLACEMENT BUREAU
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASS.**

AN AID TO ALUMNI IN FINDING DESIRABLE POSITIONS

Plan to Attend ALUMNI DAY *June 8, 1936*



THIS coming June will bring the second of the annual Technology Reunions which are replacing the old five-year jamborees. The success of the Alumni Day program last year and the fact that the coming spring brings the 75th anniversary of the granting of the Institute's charter augur a celebration on June 8 that will merit the attendance of all Technology men.



C. H. B. Richmond '14 has been appointed chairman of the Alumni Day Committee and already he has made substantial progress in planning the program for that day. Alumni desiring further information may obtain it by writing to the Alumni Association and by watching the columns of *The Review* in forthcoming months. It is hoped that all classes holding five-year reunions will schedule them to fall at such a date that members attending may include Alumni Day in their programs.

TECHNOLOGY MEN IN ACTION

CHECK-LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

In the Arts

¶ A brochure has recently been published at the Institute on the Walker Memorial murals painted by EDWIN HOWLAND BLASHFIELD '69. In addition to illustrations and descriptions of these handsome paintings, this booklet contains a brief biographical sketch of Mr. Blashfield and a tribute to the late EVERETT MORSS '85, whose generosity made the murals possible.

¶ A prize, bearing the name of JOHN TAYLOR ARMS '11, has been awarded to Thomas W. Mason of Reading, Mass., for his line engraving entitled "The Farm Lane." Mr. Arms, who is president of the National Arts Club, 15 Gramercy Park, New York City, made the presentation, choosing this engraving for "the perfection of its technical quality."

¶ WILLIAM C. WEST '11, has been elected to the presidency of the Chicago Camera Club.

¶ Another Technology man from Chicago is making an art of photography: ALEXANDER J. KRUPY '24 has just received the gold medal of the Hungarian International Salon. Pictures by Messrs. Krupy and West have been reproduced in the pages of *The Review*.

Public Service

¶ The Cambridge Housing Authority welcomes to its Board, Professor ROSS F. TUCKER '92. This Board will direct the maintenance of the new Federal low-cost housing project in Cambridge.

¶ One of the most important cabinet offices in the Canadian government under W. L. Mackenzie King, a department formed by the consolidation of Marine, Railways, and Canals, is headed by CLARENCE D. HOWE '07. Mr. Howe has had no previous experience in politics, but he is well fitted for this position. We quote from the *Boston Transcript*, November 2: "Mr. Howe is a native of Massachusetts and is a graduate of the M.I.T. He first came to Canada as a professor of civil engineering in Dalhousie University, but in 1912 he was induced by Dr. Robert McGill, chairman of the Canadian Grain Commission, who had also been on the staff of Dalhousie, to abandon an

academic career and become the Board's chief engineering expert. He did well in this post, but after a few years he resigned and formed an engineering firm of his own. It specialized in the construction of grain elevators, pulp and paper mills, docks, and similar structures, and developed a very profitable business with ramifications all over the world.

"Mr. Howe's success as a construction engineer brought him an ample competence and this year he felt free to stand as a Liberal for the Port Arthur division of Ontario in which he lives at the head of the Great Lakes. He was easily elected, and it is a great tribute to his reputation and standing that, although he has had no previous experience in politics, he has been brought straight into the Cabinet."

¶ Colonel THEODORE B. PARKER '11, who has been state engineer of PWA projects for Massachusetts since June, 1934, and has been acting state PWA director, has been given an appointment as supervising construction engineer for the Tennessee Valley Authority. His new duties began on November 15.

¶ After two years as assistant director and acting director, during the director's absence, of the financial division, PWA, in Washington, BENJAMIN W. THORON '22, has been appointed director of this division.

Lectures

¶ By CHARLES P. WETHERBEE '91, consulting engineer, at the 43d annual meeting of the Society of Naval Architects and Marine Engineers, in New York.

¶ By MARCUS A. GROSSMANN '11, a series of five lectures on "Heat Treatment of Steel," at the annual National Metal Congress and Exposition of the American Society for Metals.

¶ By LEWIS W. DOUGLAS '17, at the 20th annual meeting of Associated Industries, in Boston. Mr. Douglas was introduced by President KARL T. COMPTON.

¶ By NATHANIEL H. FRANK '23, professor at M.I.T., as one of a group who conducted a colloquium on "The Teaching of Elementary Physics," at a fall meeting of the New England section of the American Physical Society.

¶ By ERWIN O. KRUEGEL '32, at the annual dinner of the United States Institute for Textile Research, Inc., on "Scientific Wool Top Standardization to Meet Commercial Conditions."

¶ By Professor ROBERT J. VAN DE GRAAFF, Staff, on the subject of generation of high voltage electric discharges for purposes of atomic disintegration, at a meeting of the Boston section of the American Institute of Electrical Engineers.

Section of Engineering

¶ The 49th annual convention of the Association of Land Grant Colleges and Universities was held in Washington, November 18 to 20. The Section of Engineering, of which Dean WALES '02 is the new chairman, was well represented by Technology men: ROYAL L. WALES '02, dean of engineering, Rhode Island State College; ANDREY A. POTTER '03, dean of engineering, Purdue University; ARTHUR C. WILLARD '04, president, University of Illinois; ROY A. SEATON '11, dean, division of engineering, Kansas State College; HAROLD E. LOBDELL '17, dean of students, M.I.T.

Bays and Laurels

¶ To JOHN H. GREGORY '95 and to ROBERT A. ALLTON '13, as recipients of the Rudolph Hering Medal of the American Society of Civil Engineers, awarded to them in collaboration with Orris Bonney and the late R. H. Simpson, for their paper entitled "Intercepting Sewers and Storm Stand-by Tanks at Columbus, Ohio."

This is the third time that Professor Gregory has been honored by the Society. In 1910 he was awarded the Thomas Fitch Rowland prize for his paper entitled "The Improved Water and Sewage Works of Columbus, Ohio" and in 1930, in conjunction with C. B. Hoover and C. B. Cornell, was awarded the James Laurie prize for their paper entitled "The O'Shaughnessy Dam and Reservoir." All of these papers have had to do with important advancements in the art of sanitary engineering, and it is noteworthy that these three papers have all had to do with sanitary works built by the city of Columbus.

- ¶ To GERALD F. LOUGHLIN '03, on his appointment as chief geologist of the United States Geological Survey.
- ¶ To DR. WARREN K. LEWIS '05, on receiving the Perkin Medal for 1936, presented by the American Section of the Society of Chemical Industry.
- ¶ To PER K. FROLICH '23, for his appointment as chief chemist of the Standard Oil Development Company, Bayonne, N. J.
- ¶ To Professor EDWARD R. SCHWARZ '23, on his election as vice-president, director, and member of the executive committee of the U. S. Institute for Textile Research, Inc.
- ¶ To MAC SHORT '26, for his nomination to vice-president in charge of aircraft engineering of the Society of Automotive Engineers, succeeding CHARLES H. CHATFIELD '14.
- ¶ To FREDERICK M. THOMAS '29, for his appointment as chief propeller engineer of DeHavilland Aircraft Company, Ltd., licensees of Hamilton Standard Propellers, the invention of FRANK W. CALDWELL '12.

Written

- ¶ By Hugh Morrison, a book on the late LOUIS SULLIVAN ['74], *Prophet of Modern Architecture*, Norton and Company, New York.
- ¶ By HARVEY S. CHASE '83, an article prepared for the annual meeting of the American Bankers Association at New Orleans, La., in November, on "Money and Bank Deposits."
- ¶ By FRANKLIN W. HOBBS '89, president of the Arlington Mills, Boston, Mass., an article entitled, "Wool—from the Sheep's Back to Man's," published in *Monsanto Current Events*, November, 1935.
- ¶ By ROGER W. BABSON '98, an autobiography, "Actions and Reactions," Harper and Brothers, New York.
- ¶ By WILLIAM A. RHODES '12, a book, "Invitation to Industry," The Christopher Publishing House, Boston.
- ¶ By NORMAN L. SMITH '22, an article in *The Pan-American Geologist*, February, 1935, on "Geologic Theory in Mine Examinations."
- ¶ By ARTHUR E. BENSON '26, a paper presented before the Rhode Island Rubber Club, September 19, 1935, on "Pneumatic Tires—Design and Construction," published in *The Rubber Age*, October, 1935.
- ¶ By JOHN B. WILBUR '26, an article in the *Journal* of the Boston Society of Civil Engineers, October, 1935, on "Distribution of Wind Loads to the Bents of a Building."
- ¶ By RICHARD D. HOAK '28, a paper on "Correlation of Differential Tests for the Colon-Aerogenes Group of Bacteria," published in *Water Works Engineering* and also in the *Journal* of the Pennsylvania Water Works Operators' Association.

So That "He Who Runs May Read"

¶ It is obviously impossible for everyone to read all of the class notes, yet in reading only those of one's own class one does miss interesting bits in other sets. We suggest this month that you might enjoy: the trip taken by J. E. Woodbridge, Jr., son of Jonathan E. Woodbridge '93, as a member of crew of the S.S. *North Haven* (1893 notes); Lucius Bigelow's winter as exchange lecturer at the University of Edinburgh (1915 notes); difficulties of travel in Bolivia as reported by a member of the Class of 1934 (1934 notes).

DEATHS

* See class notes for account.

¶ JAMES W. ROLLINS '78, noted civil engineer, November 19, at his home in Milton, Mass. Mr. Rollins was born in Boston in 1858, son of James W. and Sophia Webb (Atwill) Rollins. After obtaining an S.B. degree at Technology, he formed business connections in Boston and was an officer of the Holbrook, Cabot and Rollins Corporation from 1906 until a few years ago. Since 1924 he held the position of vice-president and treasurer of Blakeslee Rollins Corporation. Mr. Rollins had been identified with many projects of importance, among which was the Hog Island shipbuilding project at Philadelphia during the War.

He belonged to the Boston City, University, Engineers', Milton, and Hoosic-Whisick Clubs, had been president of the Crow Point Golf Club of Hingham for 27 years, and had been president of the Boston Society of Civil Engineers as well as a member of the American Society of Civil Engineers. Of special interest to Technology men is his service as former president of the Technology Alumni Association, the Technology Clubs Associated, and two terms as member of the Corporation.

In 1892 Mr. Rollins married Clara Boyden Clark. Mrs. Rollins survives him, as do a son, Wingate Rollins '18, a daughter, Mrs. O. H. Saunders, and six grandchildren.

- ¶ LUCIUS K. RUSSELL '86, November 3.
- ¶ GUY KIRKHAM '87, August 3.*
- ¶ HERBERT W. NORTHEY '87, November 22.*

GEORGE F. DANA '93,* patron of music, November 19, at his home in Cincinnati, after a heart attack. Mr. Dana was born in Malden, W. Va., the son of Mr. and Mrs. Stephen Frink Dana. After preparation in the Cincinnati schools and graduation from M.I.T., he returned to Cincinnati where he operated the Peerless Foundry Company.

That Cincinnati is conscious of losing an outstanding citizen is shown in the following editorial from the *Enquirer*, November 12: "A community becomes strong as its leaders build industries and business enterprises. It becomes rich in the things that make life good as great-spirited men and women give of their energies in fostering the arts. George F. Dana was one of these who have made Cincinnati a delightful place in which to live, and a place which has commanded the respect and the interest of the country."

"His loyal support of the May Festivals did much to make them a premier choral event in this country. His interest in the May Festivals was not the perfunctory service of one who merely conceded that such enterprises were a good thing. He was an active member of the Festival chorus for four decades. His contribution to that magnificent institution, as one of the chorus, as a director, and as president was both informed and enthusiastic."

"Mr. Dana's death brings sorrow to a great number of friends. It can be their consolation, and that of his family, that in his lifetime he did so much to bring beauty and warmth into the communal life of his city. . . ."

¶ WILLIAM H. GREENFIELD '95, date not known.

¶ LESLIE C. ALLEN '98, November 22. Since 1917 Mr. Allen has lived in Newport, R. I., where he was connected with the John M. Friend Company, Inc. He is survived by Mrs. Allen, a son, Douglas, and a sister, Mrs. Thomas Hersom.

¶ WILLIAM TOPPER '05, June 16.

¶ FREDERICK M. HEIDELBERG '09, November 11.*

¶ EUGENE A. HUNT '09, May 18.

¶ WILLIAM C. READ '09, November 6.*

¶ IRVING P. KANE '10, engineer of treatment plant design, in Chicago, November 20.

¶ ORVILLE W. MESERVE '13, October 11.

¶ PERCY McCULLOUGH '14, October 13.*

¶ ALFRED E. VIANO '20, November 19.

¶ FRED N. BURLEW '34, September.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Technology Club of Rochester

The first dinner meeting of the year was held on November 15 at the University Club in honor of Treasurer Ford, who was attending the inauguration of Dr. Alan Valentine as president of the University of Rochester. Mr. Ford spoke to us on the future policies of the Institute regarding expansion and enrollment. He told us of current events at Technology, including the development of the Commuter's Club, fog dispersion, the new field house and athletic policies, the Frostbiters, and the recent chain-gang episode. His talk was interspersed with statistics presented in such a way that eyebrows rose and questions emanated from slightly gaping mouths. It was a snappy, up-to-the-minute speech, and it seems almost certain that our guests, Raymond Ball, president of the University of Rochester, and Raymond Thompson, treasurer of the University, made several mental notes.

Another guest and enthusiastic Technology supporter was Dr. Frank Adyotte, president of Swarthmore College and a former professor of English at M.I.T. He presented, in a few brief moments, his philosophy on education and political science, as well as a great deal of praise and admiration for his former student and colleague, Dr. Alan Valentine.

The Club is attempting a new luncheon plan this year: an informal rendezvous of Tech men, the first Monday of every month, at the University Club. There is no program, no fixed hours, but simply a table reserved for Tech men to gather around and get better acquainted with each other. We should welcome at this luncheon any Tech man visiting in Rochester on that day. — E. PHILIP KRON, '34, *Secretary*, Building 23, Kodak Park, Rochester, N. Y.

Southwestern Association of M.I.T.

The first fall meeting of the Association took the form of a dinner at the Hotel Phillips on the evening of October 15. Dean H. E. Lobdell '17 was the guest speaker of the evening.

After a very satisfying meal, C. E. Brown '20 took charge of the meeting. He called attention to the need for new officers; and, on nomination, W. L. McPherrin '14 was elected president of the Association for the ensuing year. Mr. Brown then gave a very entertaining introduction to Dean Lobdell, in the course of which he described the surprises awaiting the unwary Alumnus making a long-deferred visit to his old fraternity house.

Dean Lobdell told of many new developments at the Institute, giving particular attention to new methods of selecting prospective students and of making it easier for desirable ones to enter. Means were discussed of finding prospects at various alumni centers. At the conclusion of his talk, Dean Lobdell invited questions about the Institute and its activities. His talk was then generously applauded.

Among those present was R. B. Spencer '20, who is with the Missouri Highway Department and who had been listed in the directory as lost. Joe Havens '40 was also present with his father, H. L. Havens '09. Others attending the dinner were: R. W. Bulkley '27, M. C. Culbreath '30, F. H. Dierks '12, Bruce Ennis '33, R. L. Fossett, Jr., '33, Paul Gardner '17, E. A. Hardin '21, J. C. Irwin, Jr., '18, R. E. Jenks '28, A. J. Kilgore '25, Howard A. Kinzer '32, Charles C. Likins '19, F. H. Littrell '27, Donald MacAskill '18. — EVERETT P. WEATHERLY, JR., '29, *Secretary*, 5911 Walnut Street, Kansas City, Mo.

Technology Club of Bridgeport

An informal dinner meeting was held at the Bridgeport University Club on the evening of November 20, to sound out the Technology men in this vicinity on their interest in the reorganization of the Club. With the spark of loyalty to the Alma Mater still burning, 22 Alumni attended this meeting.

Marshall S. Wellington '16, past president of the New Haven County Technology Club, came down from New Haven and very generously acted as chairman of the meeting. He stated that Professor Locke '96 was interested in reorganizing the Bridgeport Club. Before he had had an opportunity to act, Mr. Wellington was notified by Professor Locke that a movement was already under way to accomplish that very thing. An invitation was extended by Mr. Wellington in behalf of the New Haven Club to attend the annual dance to be held in the last of January and also the annual outing held in conjunction with the Technology Club of Hartford, the last of June.

Max L. Waterman '13, honorary secretary, gave a very informative description of the activities of the old Club and gave many helpful suggestions for reorganizing the Club. — Nominations were made and the following officers were elected for the coming year: President, Charles C. Smith '27; Vice-President, Harry L. Stiles '25; Secretary-Treasurer, John E. Kearns '32. The following men were present: Marshall S. Wellington '16, Joseph H. Staggs, Jr., '17, Leonard B. Riley '27, J. Albert Robinson '02, Edward A. Mead '18, Edward L. Wemple '34, A. Gardner Fox '34, Frank M. Hartz '34, Eric Sparre '34, Charles H. Merritt, 3d, '26, Frederick W.

Green '32, John E. Kearns '32, G. Roy Fugal '34, Charles C. Smith '27, Max L. Waterman '13, Harry L. Stiles '25, Michael Kundrath '31, Robert G. Cunningham '32, Howard L. Stone '14, and Earl L. Krall '30.

The next activity of the Club will be a dinner meeting to be held shortly after the first of the year. The program will be of interest to all Alumni in the Fairfield County. — JOHN E. KEARNS '32, *Secretary*, Patterson Club, 123 Harrison Street, Bridgeport, Conn.

Technology Club of New York

"Brains, speed, and courage are the three requisites of the modern game of football. The big, rugged, husky fellows are of little value to a football team of today. The small fellow with brains is best." In such manner did William Crowley, president of the Football Officials Association, describe what he considers the most profound change which the game of football has undergone in the last two decades. Mr. Crowley was guest speaker on Football Night at the Club last October 30. Although adverse weather conditions limited the attendance, a large group thrilled to the reminiscences and stories of this famous referee, who is known as the "dean of football officials."

Mr. Crowley related how white uniforms first came to be worn by football officials. In the early days of football the officials usually wore an old suit or a pair of grey knickerbockers and a sweater. One day the colorful little referee, Tiny Maxwell, appeared on the field dressed in white from head to foot. The stands immediately began to chide him with cries of "Oh you Nestle's baby" and similar humorous sayings of the day. Mr. Crowley was umpire in the same game. He approached Mr. Maxwell and asked: "What is the matter, Tiny? Why are you wearing all white?" "B-b-because I l-l-like it," replied Maxwell, who had a slight defect in his speech. The game started. Early in the third quarter the team carrying the ball unleashed a play around the end where Mr. Crowley was stationed. Mr. Crowley, seeing the herd of players charging in his direction, started to run toward the side lines. One of the players saw this figure running in the direction of the play, mistook him for an opposing player, and with a beautiful piece of interference knocked him flat. The referee called time out until the mistaken victim could regain his breath. As he sat up, Tiny addressed him: "That was s-s-some spill you had that t-t-time, wasn't it, Bill?" "Yeh," replied the breathless Bill, "I guess they didn't realize I was the umpire." "Th-th-that's why I wear white," replied Tiny laconically. From then on all football officials dressed in white.

Mr. Crowley told many other intimate stories of Knute Rockne, Biff Jones, of Huey Long, of the famous Rose Bowl clashes, and of what happens in the 15 minutes between the halves. He was introduced by Myles Lane, famous Dartmouth star of a few years ago.

"The Present European situation with Special Comments on the Ethiopian Question" was discussed by William Finger of the Rubber Manufacturers' Association at the luncheon meeting on November 7. Approximately 25 members were present. Mr. Finger was formerly a member of the United States Consular Service and his intimate knowledge of diplomatic affairs and personalities afforded a fascinating background for his talk. He told his listeners that Italy had advised both London and Paris, through diplomatic channels, of its projected plans in Ethiopia more than a year before military action was started.

On November 13, at another luncheon meeting, Harold Searle of the International Nickel Company spoke on "Corrosion." Mr. Searle, who is an authority on the subject, discussed not only the factors affecting the rate of corrosion, but also methods of resistance. His talk evoked wide interest among the 30 members who were present.

A moving picture prepared by the park department of the city of New York, outlining the recent activities of the department under Commissioner Moses, was presented at the Club on November 19. The film, taken in excellent color photography, portrayed the changes which have been wrought all over the city to beautify the public parks and provide playgrounds for children. — Following the presentation of this film, G. E. Harcke of the Air Reduction Company, an authority on low temperatures, gave a demonstration of liquid air and its uses. He described his talk as "a little scientific story told in a romantic way." After describing in detail the manner of manufacture of liquid air and its subsequent distillation into oxygen, nitrogen, and the rare gases, Mr. Harcke carried out many unusual experiments to show the effect of its low temperature. He caused a fresh flower to turn its petals into a brittle porcelain-like substance merely by immersing it in liquid air for a few seconds. He made marbles from cranberries in the same manner, poached an egg in liquid air, and made a spring out of a coil of half-and-half solder by subjecting it to the low temperature of liquid air. A lead bell was made to ring, after being treated with liquid air, indicating the changes wrought in its crystalline structure.

In discussing the rare gases, Mr. Harcke predicted that commercial signs would soon be on the market with all colors of the rainbow, which can be made by controlling the mixtures of the different gases in the tubes, the pressure, the amount of mercury, and the voltage. This talk was very entertaining and instructive.

Interest in the Club and its membership continues to grow. It is planned to hold many small class luncheons and dinners

in the near future, and local class secretaries will shortly be appointed to sponsor them. — ASHER L. WEIL '01, *Secretary*, 22 East 38th Street, New York, N. Y. CONSTANTINE S. DADAKIS '34, *Publicity Committee*, 644 Riverside Drive, New York, N. Y.

Technology Club of Virginia

Eighteen members of the Club held a meeting at the Westmoreland Club in Richmond on November 8 to hear Dr. James L. Tryon, who gave us a great deal of new information about the Institute. We are always glad to have Dr. Tryon visit us, as his intimate knowledge of Technology brings back old memories and certainly helps us to keep up the spirit of the Institute. His visit could not have been more opportune, as our Club has been inactive for some time and this gave us a chance for a real get-together.

Miss Elizabeth Gaines '94 told the members that her father went to the University of Virginia and was a pupil of Dr. William Barton Rogers, a professor at the University at that time. Her father thought so much of Dr. Rogers that he sent his daughter to Boston Tech. William Palmer Gray '92 told about the Rogers family in Virginia. They formerly came from Williamsburg, Va. There were seven sons, all of whom became prominent men. One of the sons was our William Barton Rogers. He was a professor at William and Mary and later at the University of Virginia. Mr. Gray also told us of the great work Professor Lanza did in the organization of M.I.T.

After the speeches we held an election of officers. The following were elected: Donald N. Frazier '11, President, and John J. Fahey '29, Secretary. A Steering Committee was elected to arrange a program for 1936. This committee is as follows: Roger S. Walke '22, William R. Glidden '12, Arthur W. Davenport '23, Somerby R. Evans '23, Wanton E. Gladding '23.

The following were present: Dr. James L. Tryon, A. W. Davenport '23, S. A. Janney '31, J. H. Holleman '34, C. F. Machen '31, L. N. Miller '33, S. W. Grossmann '33, W. J. Paltz '31, S. R. Evans '23, W. R. Glidden '12, R. S. Walke '22, E. V. Lewis '28, W. E. Gladding '23, E. M. Epstein '21, Elizabeth V. Gaines '94, W. P. Gray '92, F. E. Glantzberg '27, J. J. Fahey '29, D. N. Frazier '11, R. C. Phillips, Jr., Yale '18.

The next meeting will be on January 31. We are also planning to meet with the alumni of William and Mary at Williamsburg right after the first of the year. — DONALD N. FRAZIER '11, *Retiring Secretary*, 1223 Mutual Building, Richmond, Va.

M.I.T. Club of Western Pennsylvania

The first meeting of this season was held at the University Club on Tuesday evening, November 12. Unfortunately, due to the inclement weather, the attendance was not so large as was ex-

pected; nevertheless, those who attended felt amply repaid for having braved the elements.

After a few words from Frank Chesterman '05, who assured us that the affairs, academic and financial, of the Institute were in good shape, we heard an interesting talk by Dr. Marion McKay, head of the economics department of the University of Pittsburgh, who spoke on taxes in Pennsylvania. Dr. McKay was one of a committee of four called to our State Capitol to assist in adopting new taxes this year, also one of a committee of 70 called to draft a new constitution, provided the voters chose to have one. He spoke of the existing taxes here and the difference between our tax set-up and those in other states and pointed out just where the various taxes collected are distributed.

We try to get speakers who will talk on nontechnical subjects yet on subjects of interest to all, and we hope the weather next month will be such that we shall have a large group present. — For the benefit of those who are able to attend the Friday-noon luncheons, do not forget that they are held every week at the Smithfield Grill, Oliver Building, Smithfield Street. — E. J. CASSELMAN '15, *Secretary*, Mellon Institute, University of Pittsburgh, Pittsburgh, Pa. E. A. SOARS '21, *Assistant Secretary*, Townsend Company, New Brighton, Pa.

New Haven County Technology Club

The Club held its first meeting of the year on November 6 at the Hotel Bishop, New Haven. Twenty-five men were present for the dinner, and the newly elected officers for the ensuing year were presented to the Club as follows: Thurston C. Merriman '09, President; Earl L. Krall '30, Vice-President; William G. Hodges '22, Treasurer; Albert S. Redway '23, Secretary; Marshall S. Wellington '16, Retiring President, Member-at-Large.

The speaker of the evening was James Grafton Rogers, Master of Timothy Dwight College, Yale University. His subject was "The Background of the News in Ethiopia." As he was Assistant Secretary of State under Stimson during the Hoover administration, his remarks were extremely enlightening and very interesting.

The Club is formulating an active program for the year, with frequent meetings of various types and there is every indication of a successful year. — ALBERT S. REDWAY '23, *Secretary*, Farrel-Birmingham Company, Ansonia, Conn.

M.I.T. Association of Buffalo

The first dinner meeting of this season was held at King Arthur's restaurant on November 12, with 28 of the local Alumni attending. Robert L. Hershey '23 of the Buffalo station of the Chemical Engineering Practice School spoke on the development and construction of the new sheet mill that the Lackawanna Steel Company is building in Lackawanna.

After the speech the discussion on the fine points of the steel industry was quite heated. The present conditions at the Institute and the plan of the Chemical Engineering Practice School were informally discussed by Dr. Hershey.

The announcement by President Whitworth Ferguson '22 that President Compton plans to come to Buffalo for a dinner meeting in the near future brought forth a great round of applause. — Marvin Gorham '93 spoke of his duties connected with the students at the Institute and those who plan to go to M.I.T., and Lieutenant Paul C. Warner '13 spoke on the airplanes used by the Navy. M. M. Perkins '31 resigned his office as secretary of the Club due to business pressure and Calvin H. Mohr '33 was appointed to serve the remainder of his term. After the meeting a bowling match was held with no winner declared at a late hour. — CALVIN H. MOHR '33, *Secretary*, 23 Crowley Avenue, Buffalo, N. Y.

M.I.T. Club of Northern New Jersey

Through the splendid cooperation of A. W. Lunn '09, a committee under M. M. Manshel '22 inaugurated, on October 24, the first luncheon of what we hope will be a regular monthly feature of the Club's program. Through the excellent facilities of the Newark Athletic Club, 12 members of the Club enjoyed the opportunity for a break in the day's activities and the fellowship afforded by an informal gathering.

It was agreed that similar informal meetings be held every month in the immediate future until the opinion of a sufficient number of those in the vicinity determines whether the luncheons are to be continued and how often. It was the desire of those present that the time of the luncheons be extended from 12 to 2 P.M. so that members can lunch at any time and neither be required to wait for others nor remain longer than necessary for the meal when conditions so demand. The second Thursday in each month was tentatively selected for future luncheons, the place to be the Newark Athletic Club.

A second luncheon was held on November 14 with 15 in attendance. — WINFIELD I. McNEILL '17, *Secretary*, 105 Hudson Street, Jersey City, N. J. CAROLE A. CLARKE '21, *Publicity Committee*, 10 University Avenue, Chatham, N. J.

CLASS NOTES

1877

Letters to different members of the Class asking for material for our column brought the following replies. From Kirtledge: "Your two letters have been received. The first one came when I was flat on my back with double pneumonia. I was pretty sick for a while with very high fever and didn't have much interest in passing events. It was eight weeks before I put my face out of the house. For a man who had never been sick, it was quite a siege. I am feeling quite fit again

now, however, though my locomotion isn't like it used to be. I cannot walk up stairs but I walk down all right. I ride for two or three hours daily, and the rides were fine during October. I can't walk a half mile without getting tired. Five years ago, I had an elevator put in my house for my sister-in-law (who had a bad heart) and it is coming in very handy for myself now. They insist that I go to bed at nine P.M. still, but I am getting along first rate and will be myself again before long.

"Yes, indeed, I read the '77 column in The Review, and it was splendid. . . . Perhaps after a while I can send you something of interest, but just now my powers of concentration are not very good. — I remember the baseball nine, and I played on it for a very short time. My last appearance was at a game with Tufts, which was played on the Common. I made a home run in that game and thought it was a good time to quit. I think that I played center field while I was with them. Living at my home in North Andover made it inconvenient for me to practice and play with the nine for very long. I did not play with them when they beat Harvard."

From Hibbard, two letters: "If I did not acknowledge the class picture, please accept these belated thanks therefor. I keep these photos exposed in my den and often look at them, sometimes wondering who will go next. The 'Register of Former Students' gives 36 living '77 members. Do you know where they all are? I haven't checked them up, but doubt if there are that many.

"The only item of news I have is about myself. This month I won a prize in the U. S. Seniors' golf tournament at Apawamis, Rye, N. Y., for the best selected score for two days in Class A. Two weeks later, September 24 to 26 inclusive, I won a prize in the New Jersey Seniors' golf tournament for the lowest score in Class AA. Two prizes, silver dishes, in one month sets a record for me.

"In June I had George Bartol here for a short visit and game of golf and on September 13 played with him and his daughter, Elizabeth, on the Fitchburg, Mass., course, at the Oak Hill Club. He and I seem to be the only golfers in '77 and we are going none too strong."

Regarding the "Register of Former Students" giving 36 living '77 members, there are 30 whose addresses are known and six whose addresses are unknown. We continue with Hibbard's second letter: "The only item I can send for your symposium is that of the nine graduates in mining engineering of '77, five are still living. Can any other Course show as high a proportion of survivors? The living are Bartol, Holman, Southworth, Wood, and yours truly. Some of us may equal Bobby Richards' age in due course. — A wonderfully fine autumn here this year. Good golfing weather almost every day!"

From Bartol: "I was much interested in your column in The Review, especially in the facts of Decatur's career, which were new to me. I never knew him well,

though I remember him perfectly. My most vivid recollection is of meeting him one morning as I entered the front hall and his shaking hands with me. He was wearing a ring with a sharp point on the inside. I did not resent it, though it was rather a painful greeting.

"I wish I could contribute something of interest, but my life has been rather prosaic and I see little of '77 or other M.I.T. men with the exception of Hibbard and those at our annual dinner.

"Have you read the autobiography of John Hays Hammond? If not, do so. I also was graduated as a mining engineer, but how different our lives have been!" — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1883

Fifty years ago, January, 1886, after two years in cotton and worsted mills at Manchester, N. H., where the vast Amoskeag mills were then in top notch of activity and prosperity, but now debating bankruptcy, the Secretary was relocating and repairing the gas mains of the Great Falls Gas Light Company, a subsidiary of the Great Falls Manufacturing Company at Somersworth, N. H., near Dover.

Having become manager of the plant in the fall of 1886, he had found by tests that nearly a third of the annual output of gas for the large but unmodernized cotton mills and the town was leaking from mains and services.

By a thorough overhauling of the plant, locating the leaks along the streets, and replacing broken pipes, enough of this loss of gas was prevented to pay dividends upon the corporation's capital stock, which had been innocent of divisions of profits for many years.

This personal note is for the purpose of stimulating other members of the Class to send in their recollections of activities 50 years ago. When these are exhausted, we can take up 40 years ago and so on. — HARVEY S. CHASE, *Secretary*, Bridge Street, South Hamilton, Mass.

1887

It was with great pleasure that the Secretary received a communication from our esteemed classmate, Frank E. Shepard, a few days ago, in answer to his request for news items for this column, and here it is: "It was indeed a great pleasure to hear from you and the request for news flashes regarding my recent activities gives me some concern, as I am uncertain as to the brilliancy of the illumination. I recall a saying of Ralph Vose when he was approaching a careful determination in the physical lab and when he was satisfied that the result was as near as human intelligence could develop, he would exclaim, 'that is a close approach to approximate exactness.' So I will endeavor to give an approximate account of my labors.

"My deep regret is that I have been unable to attend the class dinners and reunions of my comrades, and I have keenly missed the associations and friendships of Tech days. From 1895 to 1922 I was associated with the Denver Engineering

1887 Continued

Works in the manufacture of mining, milling, and smelting machinery, electric hoists, and industrial machinery. This established relations with the mining districts of the Rocky Mountain Territory and Old Mexico, and I found it necessary to transfer my allegiance from mechanical engineering to mining and metallurgy. One of the greatest privileges I enjoyed during this period was the association with our good friend and talented leader, Dr. Robert H. Richards '68, in the development of his devices for the classification and concentration of ores. The principles of his investigations still prevail in the milling practice of the treatment of ores.

"In 1923 I was appointed superintendent of the United States Mint, at Denver, Colo., and continued in this position until 1933, when the Democratic landslide terminated my career in this relation. During this service I found it possible to apply good engineering to the important work of coinage, and to secure for the Mint at Denver the deposits of the Homestake Mine at Lead, S. D., the largest gold mine in the United States.

"Since 1933 I have resumed the practice of mechanical engineering in the design and construction of metallurgical plants for the treatment of ores. Have just completed a large roasting plant in connection with an ore treatment plant, 500 tons daily capacity, in Cripple Creek, Colo., for the treatment of the ores of that district. Mineral production in the state of Colorado has greatly increased during the last two years, the year 1935 showing an increase of about 25% over 1934.

"In the spirit of our class motto, we look for 'Better Things' from the second generation of our Shepard family. David A. Shepard '26 is chemical engineer with the Standard Oil Company of New Jersey, has headquarters in Paris, with business relations in London, Oslo, The Hague, Berlin, and Italy. Our daughter, Jean, has attended Denver University, Chappell School of Art, and is now interested in artistic and literary activities. Richard C. Shepard is now a junior at Colorado University, Boulder, Colo.

"I was greatly cheered by your visit in Denver; also was very glad to receive calls from Taintor and Draper while I was at the Mint. Am so sorry to hear of the passing of Guy Kirkham, as he was one of my comrades during the Tech days. Be assured of my interest in the activities and personnel of the Class of '87, and my kindest regards to my classmates."

It is the sad duty of the Secretary to announce the passing of two of our classmates: Guy Kirkham, who died in Springfield on August 3, and Herbert Winslow Northey, who died suddenly at his home, 17 Cliff Street, Marblehead, on November 22. Guy Kirkham was a power in the Springfield community, a lover of art, an expert architect, most unassuming in his bearing, and winning hosts of admiring friends. An excerpt of his life and professional career as published in the Springfield *Republican* will be included in the next number of our class notes.

Herbert Winslow Northey was born in Salem, son of the late William and Margaret Anthony Northey, and lived there until their move to Marblehead. He retired from active business a few years ago. He is survived by his wife, Mary R. (Russell) Northey, also three brothers, William E. and Henry B. Northey of Salem, and Edward Northey of Boston.

The Secretary is also in receipt of a letter from Richard E. Schmidt, who writes in part as follows: "As you undoubtedly know, dear John Shortall passed away in 1934. Sturges is the same 'Mun,' jovial, liberal, and in good health. Lonsdale Green is also about and around, active as secretary of the Ohio Society but retired from business. R. G. Schmid closed his office, and I believe he retired from the practice of architecture, there being nothing upon which to practice.

"When Mayor Edward J. Kelly tendered the office of commissioner of buildings to me in July, 1934, I was reluctant about accepting it, but, urged by my friends, I did. If you realize that New York has five commissioners of buildings and Chicago only one for 180 or 190 square miles, you can understand that the job keeps me busy every day and many Sundays. When I accepted the job, I did not know that it is one of the duties of the commissioner, or his deputy, to direct the fire department in the razing of dangerous walls and other parts of buildings during the time the department is fighting the fire, and also in the search for injured or killed; consequently, I have officiated at two explosions and in the recovery of bodies caught in the ruins. — I may not find it possible to go East in 1936, but will sacrifice my belongings to attend our Fiftieth in 1937."

The class trustees met in Springfield, Mass., recently and formally appointed Edward O. Goss of Waterbury, Conn., as the third member of the class trustees to take the place of the late John L. Shortall. Goss accepted the trust. — NATHANIEL T. VERY, *Secretary*, 1 Hamilton Street, Salem, Mass.

1889

Dr. Albert Sauveur, retired Gordon McKay Professor of metallurgy and metallography at Harvard University, attended, as chairman of the group of official representatives of the United States, the Seventh International Congress of Mines, Metallurgy, and Applied Geology, held at Paris, France, from October 20 to 26. — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston, Mass.

1891

Our friend and classmate Arthur Howland passed away Tuesday, October 8. A notice of his death was given in the October Review, but too late for us to include in our class notes. Several of us here in Boston knew Arthur well, and he was a regular attendant at our dinners and reunions. He was instrumental in getting the Secretary to move to the "Radnor" on Memorial Drive, Cambridge, where he was living at the time, and Howard

Forbes also lived nearby, so that we saw each other quite frequently.

Arthur and Mrs. Howland went to our class outing in June and, while we knew he had not been well, we had no idea that there was anything serious. Later in the summer he and his wife spent two weeks at one of Dorothy Aiken Johnson's cabins on Webster Lake. We did not know that he was seriously ill until a short time before his death.

Arthur was a "kindly gentleman" and devoted to his family. He was connected for many years with Wadsworth, Howland and Company, in which his family was interested before him, and he felt keenly the changes in that organization which finally resulted in his making a change. He was much interested in colors and color photography. Arthur was fond of his classmates; he took an active part in our affairs, was always willing to help out and show his movies. He was a good tennis player and continued to play until late in life. He was handy with the bow and arrow and had charge of our archery contest at the Fortieth Reunion. We will miss him at our meetings.

Some of us attended the services. The day following, Mrs. Howland and her daughter drove to Barney Capen's and left some of the flowers. This thoughtful-ness was keenly appreciated.

The following is from the Boston *Herald*: "Arthur Howland of 86 Buckingham Street, Cambridge, a *Mayflower* descendant and nationally known for his research in color, died yesterday at the age of 67. Funeral services will be held in the chapel of the Newton cemetery . . . with the Reverend Herbert Hitchen, pastor of the First Unitarian Church of West Newton, conducting the rites.

"Mr. Howland was a son of the late Charles Follen Howland and Mrs. Blanche Carroll Howland and was a direct *Mayflower* descendant of John Howland of Plymouth Colony. He was graduated from the M.I.T. . . . having specialized in electrical engineering.

"For many years he was connected with the Wadsworth, Howland and Company of Boston, as factory business manager and later as color analyst. He did distinguished work in color research which was climaxed by his invention of the Howland color photometer, a device for the mathematical measurement of color. For the past five years he was associated with the Day Trust Company of Boston.

"Mr. Howland, who formerly lived in West Newton, was a charter member of the Brae Burn Country Club and was actively identified with the First Unitarian Church. He was a member of a number of technical societies. — He is survived by his widow, the former Mary Lois Bacon of Chicago; a daughter, Mrs. Alfred Walter of Cambridge; a granddaughter, Elizabeth Bowne Walter; and four sisters, Mrs. Frank W. Remick and Miss Ethel Howland of West Newton, Mrs. Fred K. Leatherbee of Bradford, N. H., and Mrs. Adolph Amend of Englewood, N. J."

1891 Continued

Eli Bird was in Boston recently and called up the Secretary. He is working on campaign and other cartoons. Reproductions of some of his bookplates appeared in the December Review (p. 104). — Jim Swan writes that he is worried about his daughter, who is not very well. He says he is not doing much, a little consulting work. He ran a ship trial at the S. W. Pass of the Mississippi, and another at Rockland, Maine. He attended the annual meeting of the naval architects in November. — Horace Ensworth wrote Barney in September from Southport, England, a seaside resort in Lancashire near Blackpool: "One of the most wonderful flower shows in the world here last week. Lots of people here, but the weather lately has been too cool and showery. Am feeling fairly well."

Charlie Garrison wrote in October and November. He is in Santa Barbara, having been to Altadena with the children, now comfortably settled for the winter. His and his wife's sisters will be with them, as they were last year. He writes: "The weather here is fine, with a fresh, clear air and not too warm. We walk down town and do our shopping. Grapes are very good and cheap now, four pounds, muscat, 15¢; small local grapefruit, 25¢ a dozen; small, sweet, juice oranges, five cents a dozen; raspberries and strawberries still plentiful; tasty cantelope, five cents. The beans are still good but the peas are passing."

"We were sorry to leave Marg, as she always spent the week-ends with us in Berkeley. We may go to San Francisco to stay near her for a couple of weeks at Christmas time. When we went to see her and had supper together we would walk through Chinatown and look over all the stores as they keep open in the evening. Chinese lanterns in long rows with electric bulbs were strung across the street and made a gay sight. The principal stores were all on one street for about a quarter of a mile. One dainty which you might enjoy for a feast and which was arranged in pans on the sidewalk was snails, two pounds for 15¢."

George Hooper is a member of the board of education of Pasadena. He wrote a long letter to Barney in October, telling of another trip to the San Diego Exposition: "The weather was perfect and we enjoyed it to the utmost, making our headquarters at Del Mar, a seaside resort about 20 miles north of San Diego, and driving down each day. You may remember that Arthur Alley has a beach cottage at that place and that we saw him and his sister there on our previous visit some two years ago." — He mentions various interesting exhibits at San Diego: "I think that the Ford exhibit interested me most. . . . Practically every production operation was represented in actual operation, even to rolling-mill and casting operations."

"I was flattered to see in use, in testing balls for ball bearings, a machine using the same features as one which I designed for the Deering Harvester Company in Chicago in 1896-1897 while I was in their employ."

"Attached to the Ford exhibit is an out-of-door amphitheater containing an electric organ, the tones both in quality and pitch being electrically produced. This was interesting, but is, I would say, in an experimental stage, the response of the tones to the keyboard or console being noticeably slow, the upper registers lacking in volume, while the lower were so powerful as nearly to deafen one. This instrument cannot yet compare, in my judgment, with the pipe organ."

"The television demonstration was of great interest and I was much intrigued to stand before a small panel of apparatus, speak into a microphone, and, by turning my head, see myself in the act on a screen about 50 feet away. The results were crude, but I was reminded of the first phonograph which I saw as a small boy on exhibition in old Horticultural Hall in Boston. Nothing could have been cruder than that simple, iron cylinder with threaded groove on which was wrapped a sheet of tin foil for a record. In fact, there is yet in the Hooper family archives the tin-foil record carrying a song sung at that occasion by my mother and then reproduced for the benefit of the spectators."

"The Kodak exhibition was very fine, enlargements of great size from very small films showing beautiful surface and definition. This subject also awakes memories, as I was concerned in starting the first steam plant installed by Mr. Eastman in his Kodak Park at Rochester, representing the makers of the boilers. Assisted by our Francis Viele, deLancy '90 was in charge of all operations. The whole plant then comprised but two fairly large buildings and the power plant but 300 horse power. I believe that F. A. Cole later held an important position there."

"I have just received the notice of Arthur Howland's passing. Although we were in the same first-year section, I saw but little of him, and would not have recognized him from the picture in the clipping. I have, however, had him brought to mind from time to time, because of my acquaintance with Mr. Hiram Wadsworth, one of the original, perhaps the original one of that name in the Wadsworth, Howland and Company, Inc. Mr. Wadsworth has been here for many years and is a very prominent figure in the community. He has headed about every movement for civic betterment and was chairman of the board of city directors, under which I worked when I first came out here."

"My son-in-law and son did go whaling and got one in about a three days' hunt. The creatures were formerly very numerous in these waters, but now are less frequently seen, and are usually hunted outside the Channel Islands, so called, which fringe this coast about 25 miles out. Our boys sighted the first whale near San Clemente Island, southwest of here, but were unable to get close to it. Later another was sighted and, after about a 40-mile chase, was harpooned. It was necessary to shoot it with an explosive shell to finish it, the fight which

it put up was so long and strenuous. One of the boys got some good moving pictures of the struggle but I have not yet seen them. After securing the body, a signal was hoisted which, before long, brought another boat representing a company dealing in whale products and the dead whale was sold, as it lay alongside, for about \$1,000, depending on the weight of finished products. The meat is said to be canned for dog and cat rations while the oil goes into soap. Charley Aiken would know about this latter. The whale was estimated to weigh about 40 tons."

George and Mrs. Holmes visited Barney recently. They have a third granddaughter. — From Barney comes this letter from George Atkinson: "It was very nice to receive your nice birthday greeting, but, you know, I've had so many birthdays that I think I'll cut them out; but that can't be did. We are having quite a taste of winter, the first snow storm giving us about six inches with cold that made a crust. The snowplows came out and cleared the roads and the warmer days have made the snow go, so there's only the little along the edges."

"We had a nice summer; our grandson was with us for two months and we had a fine time. He is 12 and full of life, and had a wonderful time haying, playing ball, and swimming. The town has a park on a beautiful lake about three miles away and it was our *daily trip*. I taught him to dive, swim underwater, and all the other things a boy wants to do, and, as we always took two or three of the other 'fellers,' he had a wonderful time."

"We shall probably leave next week to spend the winter with him and his folks, going to Summit, N. J., about 365 miles — which is as far as I want to go in one day. Last year we were 11 hours on the way with the Essex, but I'll do better this time with our Ford V-8. I'm still hoping to see you and hoping you are getting along well. . . ."

Changes in address: Alonzo J. Hammond, 1035 Cleveland Avenue, Evanston, Ill.; William H. Adams, 816 Hotel Gramercy Park, New York, N. Y. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R. I. BARNARD CAPEN, *Assistant Secretary*, The Early Convalescent Home, Cohasset, Mass.

1893

Inspired by the article in the March, 1935, issue of The Review, J. E. Woodbridge, Jr., son of our classmate, J. E. Woodbridge, of San Francisco, attached himself to the expedition of Pan American Airways to establish seaplane bases on mid-Pacific islands, and sailed from San Francisco on March 27 on the S.S. *North Haven*, specially chartered for the purpose. In addition to 130 adventurers, largely husky youths, so chosen to withstand hard work in the tropics, and picked also for their skill in the many crafts to be applied, the argosy carried some 6,000 tons of cargo, including everything that might conceivably be needed for the purpose, from 10-ton Diesel caterpillar

1893 Continued

tractors to pills, since there was little means of getting to the bases anything that might have been forgotten.

The expedition was not required, as commonly misconceived, to prepare landing fields, since the Pan American transpacific ships will be seaplanes only, not amphibians carrying landing gear, and will light on the water — in the case of mid-Pacific islands, on lagoons. But the chartered steamship had to carry barges and launches, building materials for quarters for the permanent crews, lighting plants and prime movers, radio stations and direction finders, gasoline and water tanks and towers, materials for landing piers and floats, accessories of all kinds, as well as commissary and subsistence for the construction crew and a stock of aviation fuel.

After a stop of a few days at Honolulu, the *North Haven* steamed west northwesterly about 1,200 miles to Midway Island, a bit of sand made famous by Robert Louis Stevenson's book, "The Wreckers." This island is inhabited by six white men operating the relay station of the Commercial Cable Company's transpacific cable. After barging to shore approximately one half its material and men at this point, the ship moved on a similar distance to another little atoll, a United States possession known as Wake Island, out beyond the international date line, the location being Longitude 168° East, Latitude 18° North. Wake Island — really three small islands, Wake, Wilkes, and Peale, with a total surface area of several hundred acres and a maximum elevation of 20 feet — is surrounded by a coral bench and reef enclosing a lagoon ideal for seaplane landing, so called. The island was uninhabited before the *North Haven* arrived.

When the *North Haven* returned there in July, after going on to Guam and Manila, expecting to pick up the construction men and return them to the mainland, the work was not finished, owing to unforeseen difficulties, and a small crew, among them Woodbridge, was asked to remain. The only ready way to get them off was via the Pan American clipper which was making occasional observational trips over the Pacific stretches. Woodbridge left Wake on October 17, flying to Honolulu via Midway, and continued from Honolulu to San Francisco by water; the clipper then on the run carried only its crew on that long hop.

He arrived at home on November 4 with many tall tales of tropical heat and storms, of moaning birds, gonies, and birds that fly backward, of brilliantly hued fish, of rats and hermit crabs, of strange foliage, and of the flotsam and jetsam of the mid-Pacific.

George F. Dana, a prominent industrialist of Cincinnati and a leader in its musical circles, died at his home there on November 19. With the Class he took the chemical engineering course and he will be remembered as one particularly active in undergraduate affairs. Dana was born October 12, 1870, in Malden, Kanawha County, W. Va., the son of Stephen Frank Dana, widely known in

the coal business. He was descended from distinguished Dutch and English families of colonial New York. During his childhood his parents moved to Cincinnati. For years Dana's home was on Dana Avenue, Avondale, named for his father. On his return to Cincinnati from Tech in the spring of 1893, he went to work for the Peerless Freezer Company, which concern he purchased four years later and expanded into the Peerless Foundry Company, of which he was president for the greater part of his lifetime.

Dana found in the musical city of Cincinnati opportunity for expression of his musical tastes. He joined the May Festival Chorus in the Nineties, when Theodore Thomas was conductor, and had sung at all the festivals since. Many years ago, he became a director of the May Festival Association and long was an active member of its chorus committee. He served for a time as vice-president and had served as president of the Association since 1927. Dana was chairman of the Cincinnati Grand Opera committee which brought the Chicago Grand Opera Company to Cincinnati and was long a director of the Cincinnati College of Music. He was a member of the Chamber of Commerce, the Queen City Club, and other organizations, and a vestryman of Christ Church.

In 1903 Dana married Miss Clarissa Halstead, daughter of the late Murat Halstead, editor and newspaper publisher. Their children are Stephen F. Dana of the Peerless Foundry Company, Marshall M. H. Dana of the Baldwin Piano Company in New York, and Miss Clarissa Halstead Dana of Cincinnati. The Danas had a summer home at Biddeford Pool, near Portland, Maine. — FREDERIC H. FAY, *Secretary*, 44 School Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, 551 Tremont Street, Boston, Mass.

1895

Another month has passed and many things are happening daily, but for some reason or other you '95 boys are mighty tight-fisted about giving your Secretary information so as to justify his feeble efforts in these columns.

Ned Huxley is having a siege in the Englewood (N. J.) Hospital, due to infected blood stream. It has been necessary to give him a number of blood transfusions. From last reports, Ned is holding his own. — Has anyone heard from David Wilkinson, whose last address was Johannesburg, Transvaal, South Africa?

Our Johnny Moore has a redheaded son, Dick Moore, a senior at Yale, who is largely responsible for what has happened to the *Yale News*. Dick Moore is the editor. Johnny has always been modest about his brilliant boys, still he should let us know from time to time how his boys are developing. We are always interested in '95 offspring.

If you are interested to know how to review technical books, write John H. Gregory for a copy of the leaflet entitled "The Review of Technical Books," which he wrote for the Wiley Bulletin.

— LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDNER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

In order that permanent credit may be given, record is hereby made that at the Pop Concert on Alumni Day last June there were present Jim Driscoll, Henry Grush, Hattie Gates, Will Hedge, Sam Hunt, C. E. Locke, and Con Young. Charlie Hapgood had set out to come but failed to appear. During the day Henry Gardner, Jim Melliush, and possibly others were around Technology, but they did not get to the dinner and Pops in the evening.

Further details on Woodwell, who died on October 23, follow: He was born January 7, 1874, in Wells, Maine, the son of William Haskell and Martha Haskell Woodwell. He was married September 14, 1897, in Boston, Mass., and had as children, Ethel Gladys, August 21, 1898, Thornton Lister, January 14, 1901, and David Titcomb, February 12, 1906. The daughter, his favorite child, was drowned in 1915 in an attempt to save the lives of several younger playmates.

He was graduated from the department of mechanical engineering with our Class, and for two years was associated with Professor S. H. Woodbridge as resident engineer remodeling the heating and ventilating system of the U. S. Capitol in Washington. From 1898 to 1908 he was successively draftsman, inspector of electric light plants, and consulting engineer with the U. S. Treasury Department in Washington. In 1908 he moved to New York City, and until 1915 he was consulting engineer, associated in partnership with Louis B. Marks. Since 1915 he has maintained his own organization as a consulting engineer at 501 Fifth Avenue, New York City.

Among his more important contracts have been the new United States Post Office, Pennsylvania Railroad Terminal, and Chemists' Building in New York City, the Onondaga County Court House in Syracuse, Shelton Mills in Shelton, Conn., new National Museum, new addition to the Library of Congress, State War and Navy Department Building, new Army and Navy Club, new Bureau of Engraving and Printing in Washington, Pennsylvania State Institution at Harrisburg, Warren and Polk, and Halcomb Steel Company in New York State, consulting engineer in connection with the construction of the U. S. Ammonium Nitrate plant for the Ordnance Department at Perryville, Md., consulting engineer to Consolidated Gas Company and New York Edison Company in New York City, consulting engineer for the city of Lansing, Mich., for the design of the new municipal power plant and electrical city distribution for light and power. At the time of his death he was engaged in further work for the city of Lansing.

He was a member of the American Society for Testing Materials, American Society of Mechanical Engineers, Ameri-

1896 Continued

can Institute of Electrical Engineers, Illuminating Engineering Society, New York Railroad Club, the National Electric Light Association, University Club, the Technology Club of New York City, and the Country Club of Lansing, Mich. He was the author of a number of technical papers, including "Data on Indoor Illumination," "The Purchase of Coal Under Specifications," "Commercial Results of the Purchase of Coal on Specifications," "Test of Moore Tube Installation," "Mail Handling Machinery of the Pennsylvania Railroad Terminal and the New U. S. Post Office in New York City," "Technology and Industrial Efficiency," and so on.

Woodwell was a man who was full of energy and he entered wholeheartedly into every undertaking. He did things in a big and generous way and everywhere he made friends. The Secretary has received spontaneously from Con Young, Charlie Lawrence, and Admiral Bakenhus tributes to Woodwell. Bakenhus tells of two different periods when he was closely associated with Woodwell: first, in the early days when Woody was in the Treasury Department and Bakenhus was in the War Department, and later during the past year or two when they were both concerned in negotiations with the Consolidated Gas Company for a reduction in the rates paid by the Federal government. Bakenhus was assigned the duty of conducting these negotiations, and he was particularly pleased to have Woodwell appointed consulting engineer to act with him. He says that Woodwell's knowledge of the subject, his thoroughness, his perseverance until every point was covered were indicative not only of his own marked ability, but were illustrative of what Technology training does for its men. He says that a number of engineers assisted Woodwell, and all had a deep affection for him, as he had the interests of those helping him deeply at heart and did much for them. Woodwell's work was one of the foundation stones that brought about a reduction of rates that will save the Federal government nearly one million dollars in three years. He was a prominent figure at our reunions, and those who were present in 1931 will remember his party, his airplane, and his generosity, which enabled all who wished to take a flight. His death occurred in the hospital where he had been confined for ten days. He went in originally for observation in connection with the many complications and internal disorders with which he was afflicted. The end came peacefully and it is believed that his physicians were rather astonished that with all the disease of the heart, liver, and kidneys his courage had kept him alive as long as it did.

Con Young reports that he is now located for the winter, and his address is 2205 Cranford Avenue, Fort Myers, Fla. When he wrote last, he said his trip south was very pleasant and comfortable and in Florida warm days with shirt-sleeve weather were prevailing. He and Mrs. Young saw Joe Clary and had him lunch with them while they were in

Washington. — Charlie Tucker with Mrs. Tucker called upon the Secretary on November 21, but much to the Secretary's regret he was not in his office and the pleasure of meeting Mrs. Tucker has been deferred.

Rockwell had a call from Billy Anderson while he was in Boston early in the fall. Billy seems to have retired more or less from active business and is devoting himself to his hobbies. He has been a stamp collector for a considerable period, and more recently he has gone into genealogy, and is presumably looking up his ancestors. It is to be hoped that he does not find any black sheep among them. — Some classmates will remember Tom Burnside, who was with us in our freshman year, but who has been missing for a long time. Recently he was discovered living in Lewiston, Idaho, and we are glad to have him back on our rolls.

The Secretary had occasion to make a visit to a dinner meeting of the Technology Club of New Hampshire, which was held in Manchester on November 7. One of the pleasures of these visits to Manchester is the contact with Sam Hunt, but this year that pleasure was denied the Secretary and, upon inquiry, it was learned that Sam is traipsing around Europe somewhere, presumably spending most of his time in Paris. This explains Sam's thirst for education, as it will be recalled that a year or more ago under class news it was reported that Sam had been taking a course in French at some college. It must be that at that time he was laying the foundation of some deep plan for getting over to Europe, with France as his objective, and wanted to get his money's worth by being able to speak the language.

The Myron Fullers have written that they arrived in New York on October 29, completing the round-the-world trip by way of Siberia in 75 days, of which 53 were at sea. After reaching Japan, as reported in the last issue of *The Review*, they crossed the Pacific, stopping in Honolulu and Hilo and seeing Professor Jaggar, although the volcano was quiescent and would not perform for them at the time of their visit. From San Francisco they took the Panama-Pacific Line by way of the Canal and Havana to New York. Off Central America they were radioed by a freighter and took a seriously ill man from it to the hospital at Panama. Near Cuba they were caught in the tail end of the hurricane which devastated parts of Jamaica and Haiti, and on the last morning before reaching New York they ran down a fishing schooner off Barnegat, N. J., smashing it into kindlings, but rescuing its crew of three.

Louis Marble of Cleveland wrote the Secretary recently very much concerned over a report that had come to him that a gentleman by the name of Locke had demised. The Secretary was delighted to be able to reply that he was still living. It seems likely that there was confusion with Colonel Frank L. Locke, who passed away a year ago. Marble seems to be well and happy, but things are rather quiet with him at the present time.

Eddie Mansfield had occasion to visit Technology on November 6, and stuck his head in the Secretary's door, but it was another case of hard luck. The Secretary was not there when Eddie called and therefore he cannot tell you what Eddie is doing, or how he looks, or what items of news he had to contribute. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1901

Edward H. Davis acted during ten months of this year as special associate in industry to the Connecticut State Tercenary Commission. He says his work consisted of "doing odd jobs in developing the 'industrial adjective' in the various and sundry observances." Perhaps you know what this means. I confess I do not. At any rate, we are glad to hear that he is back at his desk catching up.

C. G. Tufts writes from New York City: "I recently had a very enjoyable visit from J. E. Philbrick. He has been with Ernst and Ernst for some 16 years and evidently is one of their most valued men. He is specializing in the important field of depreciation and Federal taxes."

Allen B. McDaniel is director of the Research Service, Washington, D. C. At the present time he is engaged in an investigation of a municipal power plant in the heart of the Valley of Virginia. As the system includes both steam-electric and hydroelectric plants and a distribution system, including several rural lines, the project is an interesting and comprehensive one. One of his assistants is another M.I.T. man, Harry W. Goldthwaite '99. As supervising engineer for the Temple Trustees, McDaniel has recently completed the ornamentation of the dome and clerestory of the Temple of Light at Wilmette, Ill. This is a unique structure and one of the most beautiful religious buildings in the world, embodying new methods of design, construction, and materials. (An illustrated article by McDaniel describing this temple appeared in the October, 1930, *Review*.)

We are pleased to hear from our former Class President, Ellis F. Lawrence, who is located in Portland, Ore., where he is a member of the firm of Lawrence, Holford and Allyn, architects. He is also dean and director of the School of Architecture and Allied Arts, University of Oregon. He writes: "We are at last busy again in the office — three PWA jobs, about \$800,000, and several smaller private commissions. Perhaps by next June we may have the back taxes paid up enough to attend the reunion. Or, perhaps, some eastern institution may lure me back in time. Just back from a six-and-a-half day cruise up the west coast of Vancouver Island, where the sea lions tackle whales and the cougars steal the dogs from the Indian camps, where 50-pound salmon jump in bays and inlets as they do in Norway, and where they catch pilchards by the scow full for fish oil. We went through an 80-mile gale to add to the excitement. Why not have our next reunion

1901 Continued

on that Canadian Pacific boat? — I have three sons; oldest got his M.S. from Tech in architecture and now is with me in the office. Middle boy got his master's from Harvard Business and is now in property management. He just rolled down a mountain, with the result that he now has a broken nose, six smashed ribs, and a foot in a cast; otherwise he is okay. But for a flying tackle by the lad below him, we would have lost him. The youngest, just back from a councilor's job in a boys camp in Maine, will get his master's degree from Oregon this year."

R. R. M. Carpenter is vice-president and director of E. I. duPont de Nemours Company of Wilmington, Del. — N. Loring Danforth is president of John M. Danforth Company, heating and piping contractors of Buffalo, N. Y. He writes: "Business is better; we have survived the depression, maintained our organization, and look forward to a return of the building industry. How we miss Allan Winter Rowe! I am coming back to the Thirty-Fifth Reunion — keep me posted." We sure will and any other classmate who signifies his intention to be with us next June. — ROBERT L. WILLIAMS, *Secretary*, 109 Waban Hill Road North, Chestnut Hill, Mass.

1903

Notes in regard to two of the Class have come to us through trade papers or the daily press. Dr. F. B. Jewett, VI, president of the Bell Telephone Laboratories and vice-president of the American Telephone and Telegraph Company, has been elected president of its New York Museum of Science and Industry. Lounsbury, VII, has been transferred from the Superior Light and Power Company, at Superior, Wis., to Duluth, Minn., as executive in charge of the safety program for the Minnesota Power and Light Company.

We have heard directly or indirectly from 26 members of the Class about the second and third generations of '03. Of these 26, there are 34 sons, 25 daughters, and four grandchildren. Those who have attained to this last honor are Gleason, with a grandson, aged three years; George Greene, who has a granddaughter of about eight months in age; and your Assistant Secretary, who has a grandson aged four years and a granddaughter a year and a half old. We get a great thrill out of them, but can't, even if we would, feel that we have either the years or the appearance to justify the fact of their existence. Of the 59, there are seven sons and seven daughters who have been graduated from college, and ten sons and nine daughters still in college. Only three are Tech graduates or students, but this is due to their geographical location, or other circumstances, rather than any reflection on M.I.T. The colleges range from Bates in Maine to Stanford in California, and from McGill in Canada to Rollins in Florida, and the University of Arizona. The 33 students and graduates, represent 27 different colleges, showing that they are pretty well scattered. We should be glad to hear from others in the

Class. Are there any more grandchildren? — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 89 Broad Street, Boston, Mass.

1905

"Mr. and Mrs. Robert L. Thompson of Watertown announce the birth of a daughter, Joanne Thompson, at the Baker Memorial Hospital yesterday" (Boston *Transcript*, November 22). Doesn't mean a thing, does it, until we tell you that Sid Strickland, IV, is a grandpapa. It doesn't seem very long ago that we were bragging about Jim Barnes' class baby, and now we can organize a Grandfathers' '05 Club. Doc Lewis, Dr. Warren K., X, to be real dignified, has just achieved one more honor. The Perkin Medal, one of the highest awards in chemistry, given annually by the five major chemical societies for the most valuable work in applied chemistry, will be officially presented to him at the Chemists' Club, New York, on January 10.

Saw Grafton Perkins, V, recently and learned that his company, Lever Brothers, had just been granted an injunction restraining competitors from making and selling "a red health soap of octagonal shape and phenolic odor similar to Life-buoy." Needless to say, Grafton was instrumental in preparing the case for trial. By the way, if you want to read a nice, clean magazine, ask Grafton to send you *Soap*. Walter A. Clarke, XIII, writes that his life is extremely quiet and uninteresting and then tries to explain it by saying that he "is still married to the same wife and has one boy, a sophomore at Dartmouth."

Alden Merrill, V, writes: "Am about as usual, fortunately with good health, more weight than I need around the mid section. As for gray hairs, they are gray all right, but I am glad they are there to be gray. John was graduated from Dartmouth in '33 and is now finishing his first year at University of Buffalo Law School. Eleanor is finishing her second year at Smith — a good-looking, attractive gal." Which reminds your Secretary again, the Dartmouth Sons of '05 would be quite a sizable organization. A letterhead of Phelps Wyman, IV, tells that he is a consulting landscape architect, specializing in private and public grounds, town planning of parks and gardens, at 759 North Milwaukee Street, Milwaukee, Wis. After expressing his appreciation of the Thirtieth Reunion Booklet, he adds, "I was only a stray Cornellian that wandered into the landscape division of IV for a couple of years in lieu of a postgraduate course. There I knew Sid Strickland."

The histories published in the Reunion Booklet reminded Joe Brown, II, that he had a history. Joe is living at 350 Forest Avenue, Winnetka, Ill., and is regional manager of the Mining and Construction Department of Worthington Pump and Machinery Corporation, Chicago. (We supposed Joe was a Sullivan forever.) Joe's daughter, Dorothy, is

attending Bradford Junior College at Bradford, Mass. — George Jones, II, after seeing in the Reunion Booklet faces of men who had never attended reunions before wonders why they chose the one he had to miss. His son, Bayard, worked for the government about a year and a half in Washington (where he became well acquainted with Hub Kenway's son), took his senior law work at night school in Washington, and was graduated last June. Then he was admitted to the District of Columbia Bar, resigned the government job in October, went to Chicago, and was admitted to the Illinois Bar. Shortly thereafter he located a job in the patent department of the U. S. L. Battery Corporation at Niagara Falls, where he has been working for several weeks.

Frank Payne, XIII, explains that he couldn't get to the Reunion because the *Berengaria* didn't get in on time. He and 135 other millionaires were hobnobbing on that "floating palace" in the middle of the Atlantic at that time. Bet we had a better time for a couple of days than you did, Frank. George Prentiss, II, comes to bat after sitting on the bench for all these years with this interesting outline: "As to my business, personal doings, and family, there is little of public interest. Our business, of which I am treasurer and general manager, is the production of fine wires of both ferrous and nonferrous content. We have been in the iron and steel field for about 75 years, and recently branched out into alloys, including electrical resistance wires. Our largest line is book stitching and stapling wires, but we anticipate making a name for ourselves by also excelling in Fourdrinier and the resistance wires as well. Quality has always been our forte and the reason why we have built up an enviable reputation."

"My personal doings are of a routine nature, although my wife and I took one real vacation celebrating our 20th anniversary in 1930. This is the one and only investment of cash that I haven't regretted, as the pleasure derived from three months of travel from the Riviera to the North Cape, taking in the Passion Play and the Flower Festival at Montreux, can't be taken from us."

"My family consists of my wife, her invalid mother, a trained nurse, a maid, and a Springer spaniel. The Springer, who looks like an early Christian martyr, except when hunting, is the latest acquisition to the family. At present he is in disgrace, having eaten half a birthday cake carelessly placed within his reach."

"Not having seen an '05 man for years, I can't help you out with any news of classmates, but I am always eager to hear anything that has happened. From the foregoing, you have an accurate picture of practically everything that has happened in the past 30 years with nothing that you can use as news for The Review. I'm going out after birds in a few days and perhaps I'll get shot, or shoot somebody, to help you out."

1905 Continued

Carl Graesser, II, answers correspondence as readily as he responds to a toast: "The only piece of news is that I still spend Tuesdays and Wednesdays at our Boston plant, Tuesday night at the Copley Plaza Hotel. Although I have been doing this for four years, the record is still unbroken. None of my classmates ever calls me up. This is probably on account of the speech I made at the reunion. There is one exception. Andy Fisher called on me one day this summer and subsequently his boy, who graduated from Roxbury Latin, came in to see me. Young Fisher is now working in the assembly department of our Boston plant and apparently doing very well, so you see, after all, I do have some connection with our Class, even if it is indirect. Yes, I saw one other member, *viz.*, Louis Killion, who blew into my house a few nights after the reunion. He felt about as good as I did on the Saturday night of the reunion. If the Boston '05 ever get together — and it happens to be on a Tuesday night — I surely will be glad to join you."

Thanks, Carl, you're on! The first regular meeting of the '05 Steering Committee will meet in Carl's room at the Copley Plaza on Tuesday, January 14, 1936. True Files, I, will be present with his movie projector for a preview of the films he took at Old Lyme. The Committee, which is expansive enough to include anyone who wishes to see the films (or Carl), is hereby notified.

To Hub Kenway, one of our assistant corresponding secretaries, we are indebted for this news concerning Bill Spalding, III. Bill brags (and well he might) about climbing Mount Washington last summer! "I felt very proud to have wangled my paunch and my bones up Tuckerman's. The honors went to my two boys, and even Louise, aged 12, left me far behind. I drove my family to Florida, starting February 22, and didn't start north until June 8, though I expected, until a couple of weeks before, to be home in time for the reunion. I installed some equipment and started up a new process for making granulated phosphate (for fertilizer) near Tampa. The previous winter we all drove to California, where I was on a job in the middle of the Mohave Desert. Bill, Jr., is now in a small college (Deep Springs) north of Death Valley in California — his second year. It is connected with Cornell, where he plans to take his final two years. We had a very interesting talk from Doc Lewis recently at the chemical society. He sure holds on to his youthful figure and vigor well. He spoke about clays, which hit me, as I was in Georgia in July investigating a clay mine and plant!"

Tom Estabrook, V, takes exception to the name of his wife as it appeared under his history in the Reunion Booklet. Fortunately, we had kept the questionnaires and we were able to show him in his own handwriting, "Masidear." He hasn't explained it yet, but evidently he was thinking of Rogers Steps or somebody's steps. — Elmer Wiggins, V, writes

from Santa Barbara, Calif., where he evidently stopped off on his health pilgrimage, saying that the "old pump" is much better and that by the time the boat returns he expects to be ready for work again, but at a more leisurely pace, as per doctor's orders.

Two 30-year "re-uners," MacBriar, II, and Lovejoy, IX, have acknowledged receipt of their booklets with "let's do it again." Roy thinks we could do it each year, "at least us young men who are in the vicinity," as a preliminary to Alumni Day at Cambridge. All in favor, "Aye."

These changes in address appear: Roy H. Allen, III, Box 285, Cambridge, N. Y.; George A. Hool, I, 52 Vanderbilt Avenue, New York, N. Y.; Luther E. Gilmore, X, Sackett's Harbor, N. Y.; Carlton E. Atwood, VI, Suite 1, 75 Gainsboro Street, Boston; James N. Gladding, II, 1312 Roma Avenue, Albuquerque, N. M. (Reunion Booklet mailed to that address was returned. Any one know anything about Jim's whereabouts? Secretary.)

T. M. Powers Potts, I, writes from Cypress Cottage, Ralston Avenue, Mill Valley, Calif., giving that as his new address. Inasmuch as the Secretary's records, as well as the records at the Registrar's office at Cambridge had him as "deceased, September, 1905," this certainly is a change of address.

William Topper, IV, died at New York City on June 16. William O. Tuck, Jr., III, of Milwaukee, Wis., passed away on October 22. — FRED W. GOLDTHWAIT, *Secretary*, 175 High Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 209 Washington Street, Boston, Mass.

1909

As I write these notes, late in November, the class fund idea has been well received and a substantial amount has been pledged. Many others who concur in the plan are unable to contribute at this time, but hope to be able to do so later. The main thing is to get the fund started and, unquestionably, as the years go by, it will grow to be a fitting memorial of the Class from which future generations will benefit.

Much interesting information has been gleaned from the replies, as well as the sad news that three or our Class have recently died. From Mrs. Eugene Hunt comes the bare statement that her husband passed on last May 18.

Those of the Class who saw Bill Read at the class luncheon in New York on October 26 will be shocked to learn of his sudden death on November 6. To his associates at the Union Carbide Company and to the courtesy of Dr. G. B. Waterhouse, M.I.T., we are indebted for the following: "William Carlton Read, for 25 years associated in an official capacity with metallurgical research and development activities of units of Union Carbide and Carbon Corporation, died suddenly, November 6, at his home in New Rochelle, N. Y. He was 47 years old. A native of Taunton, Mass., Read was graduated from M.I.T. in 1909 with the degree of bachelor of science.

"In 1910, he became associated with Union Carbide Company at Niagara Falls, N. Y. Several years later he was transferred to the Sault Ste. Marie, Mich., plant. In 1917, he returned to the Niagara Falls plants of this company and of Electro Metallurgical Company, where he remained until 1928 when he was transferred to the works manager's department in the general offices of these companies in New York. Since 1930 he had been associated with Dr. F. M. Becket in research and development work. — Read was a prominent metallurgist and had been intimately connected with many of the major research developments in the production and utilization of ferro-alloys and alloying metals."

A few days later I received a letter from Arthur Hartwell telling of the death of Fred Heidelberg at his home in El Paso, Texas, on November 11. Although Fred had been in poor health for more than a year, the end came with unexpected suddenness. "He is survived by his wife, Mrs. Lucie Halderman Heidelberg, his father and mother, Mr. and Mrs. F. Heidelberg, a brother, Frank T. Heidelberg, two sisters, Miss Cecil Heidelberg and Mrs. L. P. Bassinger, and a nephew, Lester P. Bassinger, Jr., all of this city. Heidelberg was born in Houston, July 10, 1886. He attended the Houston public schools and, after graduation from high school in 1904, he entered the M.I.T., specializing in mechanical engineering and receiving his S.B. degree in 1909.

"During the World War, he served as an officer in the Ordnance Corps, U.S.A., and for the past 16 years had been engaged in engineering and contracting work in El Paso. — He was a life-long and devoted member of the Catholic Church."

The body was taken to Houston, the funeral service being held at the Holy Rosary Church with interment in Forest Park Cemetery. Arthur Hartwell, as one of the active pall bearers, represented the Class of 1909.

Hartwell writes also that his son Haskins was graduated last June from Rice Institute in the department of mechanical engineering, and, in addition, that he has two girls, Anne and Clarita, aged 12 and 11, and two small boys, Edward and Charles, aged nine and eight. Quite a family!

Edward T. Almy, Jr., is associated with the Sinclair Refining Company in their New York office. — Smut Nisbet has the sympathy of the Class in the death of his wife last spring. Nisbet is conducting an engineering office in Portland, Maine. — George Reppert has a son who has just entered Princeton and a second son who expects to enter in a year or two. — Chick Shaw reports that he has just bought the Deaconess Hospital for the second time in the last five years. We are glad to hear, however, that his wife is improving. — Walter Rountree's daughter is in college and his son entered Georgia Tech this fall. Walter is in the insurance business in Atlanta, Ga.

1909 Continued

Stew Pearce's letterhead denotes that the firm of Pearce, Porter and Martin, insurance counselors at Tulsa, Okla., is this year celebrating its 25th anniversary. — S. F. Barnett is located in Hollister, Calif., where he is raising tomatoes and apricots. He reports that he lost about one half of his tomato crop, due to the heavy early frosts. — Merriman's older boy is finishing his academic work at Boston University and the younger son is in his freshman year at M.I.T. — Mayo Hersey is giving a series of ten lectures at the Institute this fall on the mechanics of lubrication. Following his graduation, Hersey held the position of physicist at the National Bureau of Standards. Since 1922 he has been, successively, physicist in charge of the physical laboratory of the U. S. Bureau of Mines, chief of the friction and lubrication section of the Bureau of Standards, and mechanical engineer and head of the engineering physics division in the research and development department of the Vacuum Oil Company, Inc. He was appointed research associate in engineering at Brown University in 1934. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

The class news has been rather meager this month; however, the following changes of address have been received: Frederick A. Dewey, 320 East 72d Street, New York, N. Y.; Gorton James, Miami University, Oxford, Ohio; John F. Malone, Jr., John F. Malone and Sons, Inc., 727 Ellicott Square, Buffalo, N. Y.; Sydney I. Snow, 316 Eighth Avenue, Haddon Heights, N. J.; George E. Batcheller, 4401 Palmarito Street, Coral Gables, Fla.; Robert F. Burnett, 242 Lincoln Avenue, Fall River, Mass.

In looking over the directory of the Alumni Association, it is noted that 1910 men appear quite frequently in the various listings. Among the representatives in the Alumni Council are Charlie Greene, representing the Class, and your Secretary, representing the Technology Club of Milwaukee. On the Departmental Visiting Committee, Lewis W. Waters represents the Course in Biology and Public Health. Members of the Class who are officers of local alumni associations and clubs are: Lasley Lee, president of the Technology Club of Central Ohio; Robert S. Breyer, president of the Technology Club of Southern California; John H. O'Neill, secretary of the Technology Club of the South. Honorary Secretaries of M.I.T. who have been appointed by President Compton to act as academic ambassadors of the Institute in their communities are: Robert S. Breyer, Los Angeles, Calif.; Donald V. Williamson, one of the representatives for Chicago; John H. Ruckman, Topeka, Kansas; Frank F. Bell, Dallas, Texas.

The Secretary will be pleased to receive letters or items from any of the class members, in order that he may be able to

have our class notes as representative as those of the other classes. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

1911

First of all: Your Secretary and Assistant Secretary wish all classmates and their families a very Merry Christmas and Happy New Year! May you all live long and prosper and may many of you be present at our Silver Anniversary Reunion June 5, 6, and 7, 1936!

Our popular First Marshal at graduation time in 1911, Colonel Theodore B. Parker, III, relinquished his duties as Massachusetts PWA chief engineer on November 10 to accept an appointment as chief construction engineer for the Tennessee Valley Authority, leaving immediately for Tennessee. This is a well-merited advance for Ted and we of the Class are proud of him, although we'll miss him greatly here in New England. Says the Boston *Herald* on November 6:

"Colonel Parker, nationally known as an expert in the construction of hydroelectric plants, will be the directing engineer of all construction for the TVA. The extent of the responsibility which will rest on him has not been officially disclosed, but it was announced yesterday in Washington that he will head the engineering division handling all construction work. Colonel Parker, who is 44 years old and lives at 115 Woodlawn Avenue, Wellesley Hills, has had a notable career as an engineer in the United States Army and in civil life. He is a specialist in hydroelectric developments. He was born in Roxbury, the son of Franklin and Sarah B. Parker, but has lived in Wellesley Hills since boyhood. At Wellesley High School he was rated as one of the outstanding scholastic baseball players in the state. He was graduated from Tech in 1911.

"His engineering connections have brought him in close contact with many of the most important hydroelectric projects in the country. He was assistant engineer on the construction of the Grace, Oneida, and Cove hydroelectric plants in Idaho and he investigated the undeveloped possibilities for hydroelectric power in Nebraska, New York, and Philadelphia. His work included study which preceded the construction of plants in Wallen, Paupack, and Safe Harbor, Pa. He directed the engineering research for the 350,000 horse-power plant at Conowingo, Md., and a smaller plant at Osago, Mo., and he designed the plant at Bartlett's Ferry, Ga. One of his most important assignments was engineer in charge of the construction of the 200,000 horse-power plant at Rock Island, Wash., where the first attempt was made to harness the power of the Columbia River. During the World War, he commanded a company of the 26th Engineers. During his service as state PWA engineer, he passed on projects representing an expenditure of hundreds of millions of dollars and his judgment determined the submission of such projects to Washington for final approval." Ted's work in the Army Reserves, as the

active commanding officer of the 319th Engineers (Combat), has been taken over temporarily by the next senior active officer of the regiment, who happens also to be a 1911 man: Major Carl G. Richmond, I. Captain A. W. Yereance, I, is assigned to the same regiment as supply officer and he also commands the headquarters and service company.

At our usual 11th day of the 11th month dinner, this year we had 17 classmates present and Roger Loud, VI, chairman of the Reunion Committee, led an interesting discussion, during which he said that he would soon have his committee appointed and the place decided upon. Doubtless you will have received first publicity before these notes, written just before Thanksgiving, appear.

For the usual talk-around it was suggested by O. W. Stewart, I, that each man add to his usual story his hobby. Here in brief are the yarns spun: Johnnie Bigelow, IV, present at his first class dinner in a number of years, reported that he was back in his home town, Marlboro, Mass., practicing architecture. He and his wife have a daughter, 22, and his hobby is politics, local history, and genealogy. — J. Burleigh Cheney, II, present for the first time at an '11 dinner at Walker Memorial, is now WPA administrator for the state of Rhode Island and says his big task now is to get 13,000 people back into private industry before March 15, 1936. Last year he had a most interesting 12 months on a state commission studying prison labor. He and his wife have a daughter, 17, who on November 9 won the title of Providence High School girl tennis champion. His hobby is chamber of commerce and New England Council work, also an egg farm, where he has 100 chickens. — Obie Clark, II, is principal owner of Nelson Cement Stone Company in East Braintree, manufacturing concrete products, and his hobby is studying developments of precast units for housing. — Royal Chef Cushman, IV, travels for the Metropolitan Pipe and Supply Company. Lester and his wife have a boy, who is a freshman at Tufts, and a daughter in Medford Junior High School. His hobby is trout fishing. — Your Secretary is enjoying his work as assistant manager, Hotel Bancroft, Worcester. He and his wife have a boy and girl in South High School, Worcester, and their youngest boy, 11, is in Woodland Street School. He stated his hobbies as music and playing with his youngsters. — Bill Goodhue, I, with the Metropolitan District Commission, supervises construction of roads and bridges. His hobby is his flower garden at his home in Winchester, in which he is joined by his wife and 23-year-old daughter.

Ned Hall, II, is in charge of maintenance and power for the Merrimac Hat Corporation at Amesbury, manufacturing wool-felt and fur-felt hats. He and his wife, now living at 3 Allston Street, Amesbury, have two girls, 17 and 13, and a boy, 15. His hobby is sailboat building. — Charlie Linehan, with a new home for himself, wife, and year-and-a-half-old daughter at 10 Longfellow Road, Cam-

1911 Continued

bridge, still teaches at Rindge Technical School, Cambridge, and his hobby is athletics. — Jack Herlihy, II, has been 22 years with Edison Company and is superintendent of the supply division. His oldest boy, 18, is a freshman at M.I.T., while he and his wife also have a girl, 15, and boy, 14, both in Medford High School. His hobby is photography. — Hal Jenks, VI, is now located at the Army Base in Boston, helping to clear up the relief situation for the WPA in the Second Middlesex District. He and his wife have a daughter, 18, a graduate of Newton High School '35, who is now a freshman at Monticello College, Godfrey, Ill., a boy, 14, and a girl, 11, both in junior high in Newton. He says his wife claims his hobby is reading the *Saturday Evening Post*, but he believes it is his work as a troop commander in the Newton Boy Scouts.

Ray Lord, VI, appeared at his first '11 dinner for a long, long time. He and Burleigh Cheney came up from Providence together, and Ray said he drove a "one-man show" up. He has been with Manufacturers Mutual Life Insurance Company for 15 years, traveling for 10 years, and now in legal and tax matters. He and his wife have a girl, 21, Simmons '35; a girl, 18, a boy, 15, senior and sophomore, respectively, in high school; and a girl, 13, in Providence Junior High School. His hobby is law study. — Roger Loud, VI, has recently completed 20 years with Boston Edison and this was marked by a dinner at Hotel Bradford, Boston, where his fellow employees in the commercial cooking division had a big cake for "Uncle Roger" and gave him a splendid pair of Lloyd's binoculars. He and his wife have two boys, 14 and 10, one a sophomore in high school and the younger in the fifth grade. His hobby is astronomy and making telescopes and his oldest boy is keen on both subjects. — Roy MacPherson, II, maintains an experimental laboratory in his home town, Framingham, for the study of manufactured fuels. He and his wife have one daughter, 20, and his hobby is sailing and radio.

Carl Richmond, I, travels a lot for Arkwright Insurance Company. He and his wife have boys, 4 and 2. His hobby is army reserve work and amateur photography. — O. W. Stewart, I, has been 25 years with the same concern, Factory Mutual Fire Insurance Companies, being now assistant manager of the inspection department. He and his wife have four boys, the oldest being a freshman at M.I.T. His hobby is winter sports. — Emmons Whitcomb, X, reported that travel business is improving. Compared to a year ago he is doing 60% to 100% more each month. His hobby is flying. — Gordon Wilkes, II, was the faculty representative of the Class at the dinner. He also has a son in the freshman class. His hobby is golf.

M. E. Comstock, VI, sent regrets for this dinner and stated that his oldest daughter, Barbara, is now a freshman at Radcliffe. — A. V. de Forest, XIII, had hoped to attend but could not. On his reply card he said: "Still at M.I.T., trying

to learn faster than the students." — Henry Dolliver, I, was kept from the dinner by a business trip to Charlotte, N. C., where he is spending a few weeks on appraisal work for Jackson and Moreland.

Ralph Adams, II, like Wilkes and de Forest a member of the Institute Faculty, all three in Mechanical Engineering, was recently the winner in a student poll conducted by *The Tech* to discover the most popular professor. Congratulations, Ralph! — Don Stevens, II, wrote recently that he was just keeping busy on one thing or another, as usual: (1) cables (vice-president, Okonite Company, Passaic, N. J.), (2) civic work (taxpayers associations, local, county, and state), (3) building and loan, (4) committee work (National Association of Manufacturers, National Industrial Conference Board, National Electric Manufacturers Association). — On the first Sunday in November, I was delighted to have a call here at The Bancroft from Chet Morey, II, and his wife and daughter, Cynthia, motoring from Providence. He is with the Rhode Island Tool Company there.

For closing, I have saved a fine, newsy letter from Harry Tisdale, V, who is with the American Dyewood Company, 100 East 42d Street, New York City. The spirit of the first paragraph is admirable and I hope that of the last sentence of that first paragraph will be particularly infectious: "Noted reference in the class notes about the Twenty-Fifth Reunion. I take it that you have not decided on the place yet. I would be in favor of the Riversea Club at Saybrook, but suppose the majority of the Class would rather have a spot nearer Boston. As I have said before, it will not make any difference with me where the Reunion is held, the Mrs. and yours truly will be on hand. Just for the sake of the record, we moved to 138 Lyons Road, Scarsdale, N. Y., on October 1. So far, we like the country very much and we live just around the corner from Joe Harrington, VI. I have been away quite a bit the last few months and have found business in wool and leather trade very good and prospects for even better conditions.

"Spent 10 days on a Canadian business trip recently and have just returned from a two weeks' trip in the Middle West and South. Came back from Atlanta via plane, which of itself is nothing to write home about as everybody is traveling that way now, but it was my first long ride and everything was O. K. until we arrived over Newark in a fog. We stayed up at the 6,000-foot level for over an hour and that was something — not knowing where we were going or why. The pilot finally found a hole and we came down O. K. . . ."

Once again: Season's Heartiest Greetings from Dennie and Jack! — ORVILLE B. DENISON, *Secretary*, Hotel Bancroft, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

On Thursday, November 12, an even dozen members of the Class responded to the call for a luncheon meeting in the

McGraw-Hill Building, New York. Those present were: J. A. Appelquest, VI, C. A. Cary, I, C. H. Carpenter, II, P. E. Golsan, VI, N. A. Hall, VI, E. M. Mason, II, C. E. Morrow, IV, S. H. Seelye, VI, J. I. Murray, VII, C. B. Vaughan, II, L. A. Matthews, VII, and D. J. McGrath, I. Golsan was almost embarrassed by the commendations bestowed on him for building up and printing an up-to-date register of the Class. Vaughan reported that Dave Dasso is in the Argentine Republic on business and may not be back in the United States for several months. After the usual conversations about the state of the weather and of business, neither of which we could do much about anyhow, we suddenly found ourselves in a lively discussion of the prospects for the next reunion.

Although it's still over a year in the future, it seemed to be agreed that we couldn't begin too early to plan and promote the biggest reunion the Class of 1912 can ever hope to have — the Twenty-Fifth Year. Among other points, an interesting plan was suggested whereby it might be possible to arrange some sort of average assessment on every member of the Class, which would provide a transportation pool to bring every living member in for the reunion, from the farthest ends of the earth. It seems that with the comparatively large proportion of members still living in and around Boston, New England, and New York that the average transportation cost for everyone would not be likely to involve a very large contribution by any one. We invite comments on this idea, and any other suggestions members of the Class may have for our Twenty-Fifth Reunion. All your suggestions will be kept and handed over to whoever is appointed to head the reunion committee.

Golsan has handed us the balance of the letters received in connection with his canvass of the Class, so we are now able to give you a few more items of interest. Major Harold C. Mabbott, II, U. S. Army, writing from Fort Leavenworth, Kansas, will be studying until June, at which time he expects to be transferred, possibly to foreign service. He can always be addressed in care of the Adjutant General's Office, Washington, D. C. — Ralph M. Ferry, II, writes that along with other activities, he is becoming an addict of duplicate bridge and he says: "I don't know how much of a fad duplicate bridge has become in the East, but it seems to be covering this section of the country like a blanket. We have intercompany plays twice a month. Last Monday night, we had 116 men playing at 29 tables. On alternate weeks the star players from our organization represent the company in the Industrial League in Pittsburgh. Outside of the interest in bridge, this has turned out to be quite a fine program, as we have men represented from practically all of the various divisions of the company and it gives us an opportunity to contact some of the men at least twice a month."

L. T. Cummings, VI, writing to Golsan says: "I think you have done a real work in getting out this list, and every

1912 Continued

member of the Class should appreciate it. I am particularly interested in the geographical register which it contains due to the fact that I travel around quite a bit from time to time and, when I reach various states or cities, I would like very much to contact any members of the Class who might be there. However, when I arrive, I have no means of telling who might be there, and your folder will certainly be very handy."

Albert L. Pashek, VI, contributes the following: "I meet quite a few at our local alumni club, *when we meet*. Chester Dows is still the same Chet. I guess we are all more or less settled in our habits of living. Many have left engineering entirely, some have graduated to the retired list, and others are more or less concerned with their originally chosen vocations. For myself, I am really doing mechanical-engineering work as head of the Ohio branch of industrial engineers of Socony Vacuum Oil Company. I have achieved neither fame nor fortune, but have acquired some girth, a certain amount of baldness, and a docile disposition. I say the last advisedly as I am still a bachelor, hence have had no real tests of my temper unless it be combating the sales department and its vagaries."

William C. Lynch, II, writes from Los Angeles, Calif.: "I expect to be back East some time in the fall and will look you up." — William A. Rhodes, VI, is the author of a much-discussed book "Invitation to Industry." The reviewers have commented very favorably on this work. Your Secretary has written for a copy and will attempt to digest it. Reports later! — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

1913

The reason why news of this Class has not appeared in recent issues of *The Review* is due wholly to the lack of correspondence from classmates. Even our genial President, Bill Brewster, fails to announce to the Secretary visits which he makes to Boston and even to the Institute. However, a few changes of address may be of interest.

Allan G. Waite retired as general partner of the Boston Stock Exchange firm of Arnold Sears and Company. — Malcolm Lewis has moved from Washington, D. C., and is now located at Raleigh, N. C. — Nathaniel Sage has apparently gone back to educational pursuits, and is located at the Putney School, Putney, Vt. — J. B. MacNeill has been transferred from the Boston office of the Westinghouse Electric and Manufacturing Company to the home office at East Pittsburgh. — George B. Sampson is now living at Holyoke, Mass.

News reached us sometime since of the death of Barton E. Brooke at Youngstown, Pa., June 29. Brooke was the outstanding architect in his community, specializing in industrial and public buildings. We regret to announce, also,

the death of Percy L. Flansburg on February 2. — ARTHUR L. TOWNSEND, *Secretary*, Room 3-435, M.I.T., Cambridge, Mass.

1914

It is with profound sorrow that we record here the death of Percy McCullough, in Manchester, England, on October 13. Because of his quiet nature, Mac was not known to many other than his electrical associates when at the Institute but, to those who knew him, he was one of the most likable and kindly members of our Class. Soon after graduation Mac went with the Angus Jute Company, at Calcutta, India, later returning to the United States to go to the St. Louis headquarters of the Bemis Bro. Bag Company, with which the jute company is associated. Over ten years ago he went with the English associated company, the MacGadco Company, in Manchester, with which organization he continued as an officer until his death. Besides his wife, McCullough leaves a daughter, 17, and two sons, 15 and eight.

One of McCullough's associates has written to Phil Morrill of our Class the following tribute: "We would take this opportunity of informing you with deepest regret that Mr. McCullough passed away very suddenly on October 13, while attending to his car. The cause of this tragic accident was the exhaust fumes which had accumulated owing to the fact that only one door of the garage was open at the time. — We mourn the loss of a most able administrator and a true gentleman, and it is a matter of deep grief to us that such a life should be cut short so tragically."

More honors to E. C. Wentz. The various electrical technical journals, as well as the press, have carried articles of an award to him of the Progress Medal of the Society of Motion Picture Engineers. This award was made at a meeting held in Washington in October. The following regarding the award is taken from the Springfield, Mass., *Daily News*: "The award, which is to be given each year for outstanding inventions in motion-picture technology, went to Dr. Wentz in recognition of his work in acoustics and acoustical instruments with special reference to their application to the recording, transmission, and reproduction of speech and music in moving pictures. — Dr. Wentz is research physicist in charge of acoustical investigations of the Bell Telephone Laboratories in New York City. He was graduated from the University of Michigan in 1911, and received a degree in electrical engineering at M.I.T. in 1914. He held the John Sloane Fellowship in physics at Yale and was awarded a Ph.D. degree from that institution in 1916. He started with the research division of the engineering department of the Western Electric Company, predecessor of the Bell Telephone Laboratories, in 1914."

The New England Section of the Society of Automotive Engineers is annually treated to a talk by Dean Fales on the subject of the new models brought out at the Automobile Show. Because of the fact that the show occurred in the fall this

year instead of in the winter, the talk by Fales was given on November 12. As usual, a large crowd turned out to hear Professor Fales tell of all kinds of models he saw in New York.

It was your Secretary's pleasure to have spent a few days recently in Northfield, Vt., with President Porter Adams of Norwich University. Adams' many friends in the Class will be exceedingly interested to learn of the splendid work that he has done toward rehabilitating that university. While there your Secretary was accorded the honor of reviewing the Cadet Corps. This university is a military institution and is often referred to as the "West Point of New England." It is one of the very few cavalry training schools in the country.

H. S. Busby is taking a very active part in connection with southern CCC camps. Since February, 1934, he has been one of the educational advisers covering the development of camp programs and projects. In April of that year Busby became state educational adviser of Georgia and had the supervision of 53 camps. In July, he became assistant corps area adviser, with headquarters in Atlanta. In that position his work covers the development of teaching methods and facilities, oversight of the central visual educational program, which program distributes about 1,300 educational motion pictures a month to the camps, and the general supervision of the educational personnel in the area.

Saved for last is the choicest morsel of news of the month. The last line of resistance in our Class appears to have fallen. All hail and greetings! For on October 26 the engagement of Miss Marian Cartwright Andrews to Harold Sutherland Wilkins was announced! Miss Andrews is the daughter of Mr. and Mrs. R. H. Lawrence Andrews, of the Groton School, in Groton, Mass. She attended Wellesley College as of the Class of 1930 and was graduated from the architectural course at the M.I.T. with the Class of 1931.

These notes will arrive during the holiday season. Your class officers extend to every member of the Class their sincerest wishes and hope that each of you will make a New Year's resolution to attend Alumni Day — June 8 — at the Institute this year. — HAROLD B. RICHMOND, *Secretary*, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N. Y.

1915

Latest news flash! A candidate for the Class of 1953, Peter Scully, was born on November 3 at the New England Baptist Hospital, Boston. Our congratulations to Mrs. Scully and Frank and the best wishes of our Class to young Peter.

How the boys do stray from the paths of science and engineering. Meet the new Kentucky colonel, suh! It's a pleasure to tell you that Herb W. Anderson, president of the Fidelity Machine Company, Philadelphia, was appointed this fall aide-de-camp with the rank of colonel on the staff of Governor Ruby Laffoon of Kentucky. We know Herb can tell the

1915 Continued

stories that well go with a jolly class reunion but we doubt whether his stories would be approved and accepted in the cloistered dignity of his new position.

Further wanderings: Bertram E. Adams is a magician. Quoting from a recent Boston newspaper description of his performance for the benefit of some newsboys at the Boston Chamber of Commerce, we find that he's in a class by himself as a demonstrator of super-magic; mysterious, baffling, uncanny, and different. He is a former president of the Society of American Magicians and is an honorary member of several European magical societies. He has written several books on the subject of magic.

As my material and imagination run low, I fall back on reliable Lucius Bigelow for the following splendid and interesting letter written last December, but still a masterpiece for our column, because of its detailed descriptions and keen observations and its delightful humor: "I have something to report which is somewhat out of the ordinary — for us at least. In September, 1933, my wife and I sailed for Antwerp, bound ultimately for Scotland, where I was to be exchange lecturer at the University of Edinburgh for the academic year. After about 10 days on a slow but comfortable boat, we arrived in the Scheldt River one morning and were held up by a dense fog. Absolutely nothing could be seen. Suddenly the fog lifted, and revealed no less than 14 ships immediately surrounding us. I shall not soon forget that startling apparition. Later we were slipped neatly into the Antwerp Lock, with fair room to spare, but we did not go on just then. They put four big ships in that little lock at once, seemingly without an inch of extra space available, and yet with such skill that none of the craft even grazed each other.

"Antwerp, which is one of the largest seaports in Europe, has much of interest, but we were able to remain overnight only, which was quite long enough to become acquainted with their especially vicious breed of mosquitoes. Soon we arrived at Ostend, crossed to Dover, and were rolling through the beautiful green fields of southern England. Wonderfully green grass and trees, beautiful flowers, and, may I add, not many billboards. When will we learn over here?

"The trip north on the *Flying Scotsman* was all that could be desired. The green grass gave way to gray, barren moors, with a glimpse of rock-bound coast once in a while, where the ocean swells thudded against dark, gray cliffs, throwing white foam and spray high in the air.

"When we arrived in Edinburgh, we were most kindly and courteously received. The Scotch may be canny with their money, but they are liberal with their hospitality. Edinburgh! City of ancient tradition, with its great rock, crowned with the castle that has been there since time immemorial, and its old houses and 'closes' dating from 1500, all mixed in with the thriving activities of an up-to-date modern city. Left-handed traffic, double-decker trams, all stone

houses, and huge windows immediately attracted our attention. The last are needed, for in December the sun doesn't really get up until around nine A.M., is only 11° above the southern horizon at noon, and is ready to disappear again not long after three P.M. There is no central heating in houses, since the beneficent Gulf Stream keeps the country from freezing solid, to say the least. One must, nevertheless, stoke a fireplace 10 times a day or freeze to death, and believe me I did not freeze (quite). There was no appreciable snow in the city all winter, and the temperature did not get below about 20°. The climate of Edinburgh is not so bad as some people claim, and we had many beautiful days, but you often have to reckon with a thick Scotch mist, mixed with a raw east wind at a temperature just above freezing. That combination would penetrate a stone post, not to mention a human being!

"The Scotch students are very reticent, but if you can get behind this reserve, they are quite as nice chaps as you will find anywhere. They impressed me as somewhat more mature than our students of equal age, and also as more serious minded. This is undoubtedly due to the fact that there are over there a much greater proportion who never reach college at all, as well as to the difference in the educational systems. One thing stands out: success or failure is put squarely up to the man. As an example, I had a beginning graduate student who lacked essentially a year's work really prerequisite to the problem in hand. I was directed just to tell the boy to go and get that material by himself. With considerable skepticism I did so, but within a couple of months the young man was discussing the technicalities of this problem in as mature a fashion as could be desired. That incident left me with a somewhat enhanced idea of what can be done with a good head, a serious purpose, and an adequate library.

"As for myself, I was provided with a private laboratory and every possible help in the way of apparatus and of cooperation. Consequently I was able, under the direction of the head of the division of organic chemistry, Dr. H. Gordon Rule, to complete a rather satisfactory piece of research. I did not do this, however, without consuming the three weeks' Christmas vacation and the four weeks' Easter recess right on the job. In this connection, it is interesting to note that over there one is never supposed to appear particularly busy. A staff member rarely appears at his office before 9:30 A.M. or maybe 10 A.M.; often leaves for tea at 4:30 P.M.; and they take a fairly liberal lunch hour. There is no heat on in the building, even in midwinter, after four P.M. Why hurry? And yet, they get results just the same. Otherwise the academic censure would be quite as severe, ultimately, as it is with us. At first, I rushed around the building in the usual American fashion, but soon began to see that I was the only one who did or would do it. After a time, I began to wonder whether or not we have something to

learn by observing the ways of those who manage to achieve scientific distinction, and yet never seem to be in haste.

"Work and the state of the exchequer prevented us from traveling a great deal. However, we visited Cambridge, Oxford, and London, the famous ruined abbeys of the border country, the University of St. Andrews, Glasgow, and the Isle of Skye. I wish I might detail my impressions of the university towns and the great metropolis, but it would take a volume. The rugged, bare mountain scenery of Skye was wonderful. They say it rains there nine days out of ten, but the day we arrived there was not a cloud in the heavens. The pale-blue sky, the deep-blue water, and the towering gray mountains, standing out as if in silhouette, gave a perfectly marvelous effect. So did the beautiful mountains of the West Coast. We were so well treated in Edinburgh that when the time came in June to embark at Leith for Antwerp, I was genuinely sorry to leave, glad as I was at the prospect of getting back to the U.S.A.

"We spent another day in Antwerp, a day in Brussels, and a day in Ghent, where I visited the University of Ghent and was most cordially received at the chemical laboratory. In Belgium I was impressed by the appearance of poverty and the effects of war and depression. The cathedrals are positively magnificent. Once seen, as in England and Scotland, they are never to be forgotten. Finally, we were able to stay five days in Paris. The view of that great city on a clear day from the top of the Eiffel Tower simply beggars description. Also, as I stood on the great Place de la Concorde, I couldn't help thinking of that great host who departed into eternity via the guillotine, hardly an emblem of peace and concord. To know Paris, or London, would take a lifetime. What can one do in five days! Being myself a total abstainer, I got as much 'kick' out of the obvious disgust of the waiters in the Paris restaurants in serving us water to drink as if I had too freely sampled their elegant (and expensive) champagne. Their food is excellent, their service impeccable, their champagne presumably fine, but their coffee is unspeakable. And so, with just a glimpse of the ever gay and happy (on the surface) Paris, we took the boat train for Le Havre where we stepped aboard the boat which safely brought us back under the shadow of the Statue of Liberty.

"We had a profitable, broadening, and enjoyable experience, of which the above running account is the merest outline. It wasn't much, compared with the travels of many others, but to us it meant a lot."

Happy New Year to you, with my best wishes for good health and successful business. — AZEL W. MACK, *Secretary*, 72 Charles Street, Malden, Mass.

1917

Nineteen-seventeen's official representative to the Alumni Council and hence to the alumni body as a whole has returned to his quiet sanctuary from a grand tour. His itinerary included Kansas City, St. Louis, Milwaukee, Great Falls, Butte,

1917 Continued

Chicago, Minneapolis, Salt Lake City, and Denver. Disturbances of various sorts followed in his wake, ranging from minor riots in the conservative East to earthquakes in Montana. Carefully censored reports filtered back to the University City and so consistent were they in their general tenor that a flock of experienced war reporters was planted in Chicago to await and record his arrival there. Ably they fulfilled their mission, yet the effective censorship still prevailed, and, as we go to press, we can only give you their reports and allow you to read between the lines.

Here is the first account from the portable typewriter of Rad Stevens, hero of many a wild and gruesome battle and himself a prominent headline gatherer. Note his sympathetic touch: "I had intended giving you a correct report of the 1917 Chicago District Reunion before, but the press of Christmas rush business has prevented it. I know that I was the only one at the reunion who was in condition truthfully and accurately to report the proceedings. — Our guest of honor arrived in Chicago and immediately made reservations for himself at all the leading hotels and clubs. Your reporter went to Chicago early in the afternoon endeavoring to locate him so that he could go over his speech and tell him what to say. After checking several hotels and finding he had reserved but not registered, I decided on the University Club, where I sat waiting for him to come in. He never did show up there, so, finally, I went over to the Engineers' Club, just before dinner.

"Amid the tooting of horns and much cheering, the guest of honor arrived, a half hour late, as usual. The reception committee consisted of the Clark Gable of our Class, Phil Cristal, Teddy Roosevelt himself (impersonated by Penn Brooks), and your humble reporter. The dinner was a huge success. At the speaker's left was the wrecking crew, which had now replaced the reception committee and was assisted by Duggy Jackson, president of Lewis Institute, taking his evening off. The speaker was ably introduced by our Teddy Roosevelt, who certainly gave him a wonderful send-off. He detailed a biography of the speaker, going back to very early days, and certainly created with the audience (oh, yes, we had the Technology Club of Chicago assisting) a very dignified impression of our new Dean.

"Finally, the speaker of the evening arose and so did the cheers and the hisses of the multitude. That was the signal for the wrecking crew to start work, and, if there is one thing that the Class of '17 does well, it is to wreck dignified meetings. Lobby could have no complaint because he taught us most of what we knew about wrecking meetings, but at times it was a bit embarrassing to have it hit home. In this work too much praise cannot be given the wrecking crew's able assistant, Duggy Jackson. The same crew has promised to go into action when Duggy gets in the spot Lobby was in. Needless to say, the meeting was a huge success. — The reunion then convened to

the place in the University Club where they have tables and chairs on the floor and a big counter across one end, and started seriously. The less said about this part of the program the better. Your able reporter missed three trains to Elgin and, finally, after steering Penn and Duggy across the Loop, got the last one by the skin of his teeth."

This report was so illuminating and yet so unsatisfying in its hint of interesting omission that we turned to word from Paul M. Flagg, representative in Chicago of the Travelers Insurance Company, located at 1180 East 63d Street, and ready there to serve all and sundry with means of guaranteeing prosperous old age and happy heirs. We quote: "At our recent meeting in Chicago, Penny Brooks took the assembly thoroughly into his confidence with his human-interest stories and high lights of very early days in the life of one H. E. Lobdell. My understanding was that the intimate flashes were not for publication. I think Penny already has his own copyright on this material. I am not certain whether he has registered it in Washington, D. C., or Milwaukee, Wis.

"Milwaukee, as you may or may not know, is just 90 miles from Chicago — a nice commuting distance. Of course, you do know this, as well as the fact that there is one product for which Milwaukee is famous. It is too bad that I cannot take shorthand and must fail you in this truly historical biography which only Penny Brooks in his own grand and glorious manner could possibly 'get away with.' Maybe you do not know that there were newspaper men actually attending the meeting in the guise of Alumni. I am wondering whether Penny's copyright cost them a good sum for the privilege of publication.

"The gang of '17 men present added many gallant pleasantries all through Lobby's address. He asked for interruptions and received many. May it be said to the glory of our good old classmate, H. E. Lobdell, that he held our human interest and kept it intact, preserving it completely beneath that sheet-iron boiler shell in which it is claimed he lives.

"Impetuous is not properly the word to describe M.I.T. men, nor yet would you describe them as conservative. Take, for example, John R. Daesen '22, II. During the meeting he reports sufficient evidence in writing from our active club members immediately to start expeditions, classes, teams, or what have you, varying from flora and fauna, photography, hunting, swimming, baseball, and so on, to the good old game of tennis. I wonder how active and versatile you old men down in Cambridge are getting to be. I am sure we should welcome you out here in Chicago and be glad to take you on in competition in any one of your favorite hobbies. I, myself, am an old, gray-haired man with no rating at all, but you are welcome to try me out on tennis any time."

Now Flagg but served to whet our enthusiasm, so we approached one who was a direct party to the affair, the famous

Phil Cristal himself, director of railroad bond research for the Northwestern Mutual Life Insurance Company and formerly special adviser to the throne with the huge Van Sweringen railroad interests, and we anticipated the exhaustive, critical, and authoritative analysis of the situation for which Mr. Cristal has achieved fame. Lo and behold, we have this: "There was a meeting of the Technology Club of Chicago recently! Not only was I present, but our Class occupied such a prominent position at said meeting that I hesitate to confirm, without long meditation and careful study, all of the gossip which has come to you through and from the usual sources of such news. Therefore, after many years of silence on my part, I will, within the near future, retire to the cloisters, meditate and pray (hoping that the Muses will accompany me), and try to bring forth, in the interest of truth, all of the real facts about that dinner. You may depend upon me to display the true facts, even though they may be slightly colored by reason of the gathering together in one place, at one time, of such famous personages as Penn Brooks, Harold Lobdell, Rad Stevens, and Phil Cristal. May I leave you in breathless anticipation, as it will be a *hot* story in which the now famous Dean came off victorious after a strenuous battle?"

Your Secretary has other notes, but finds himself unable to lead his mind away from that last enticing paragraph of Phil Cristal's, and so we end, regretting that time, tide, and The Review wait for no man — except Lobdell. We hold our breath for 30 days, awaiting the one complete, honest, and uncensored account of this typical occasion on the Dean's triumphal tour. — RAYMOND S. STEVENS, Secretary, 30 Charles River Road, Cambridge, Mass.

1918

To the disquieting story in the November notes of how Bill Wills had been victimized, comes this sequel with a righteous ending: "In order to complete the record of the man who stole my medal, I might make the following comments. The medal was not my gold medal which is in the safe deposit box. It was just another medal. Of course, the affair did make me a little cross and so it was necessary to arrange with the proper authorities to put the man away for several years. This made me feel sorry for him, but you must realize that he should never have done it." Excerpt from Savannah paper: "Solicitor General S. A. Cann . . . said today a man extradited from Florida under the name of Daniel Webster Kingsbury had pleaded guilty to a charge of obtaining money under false writing and received a sentence of two to four years in the penitentiary." To medal-winning architect Wills, our hearty congratulations; to medal-stealing Daniel Webster Kingsbury, our most paternal, "Now will you do it again?"

Stimulated by a snapshot magnificent with dust, depicting Donald Merrill's home-made canoe sailing down the Taun-

1918 Continued

ton river atop its own image, we stopped being a notorious dawdler long enough to send it to him with the usual, "Your contribution will be welcomed at our regular rates." So he has enlivened our editorial moments with the following: "Yes, that photo is getting on. I have another print which bears the date November 18, 1917. Times may have changed some since then, but in one regard the fellow in the picture is still the same. He hikes off down the river at every opportunity. In fact, the whole family was down there today (November 3) to sail on the falls while we wound up the sailing season by hauling out. I bring the boat home in the company truck so I can have it in the back yard to look at all winter."

"Sometime last winter (or it might have been spring, although there was snow under foot), I had an hour to spare in Albany, so I scooted over to the D and H building and looked up Harold Fitch. Found him all right, and we talked fast to bring everything up to date from the time I left him with the power-plant problem in December, 1917, while I went to War at Watervliet Arsenal. Harold thought it was nice that the class notes had furnished me with the information of his whereabouts and it would be fine if we had a class directory. Outside of that, the class notes were fierce, but Course II men, at least, knew what to expect! Harold should be a judge in the literary line, as he stocked me up with enough of his D and H publications to keep me occupied on the trip home."

"Early in the summer I met Byron Cleveland on the platform at Springfield, Mass. We were both bound west and had dinner together. He is now located at Windham, Conn. (near Willimantic), engaged in the manufacture of paper-bag machinery. We were both rather short on recent class news, but found plenty of old subjects to recount."

"Also while waiting for a train at Columbus, Ohio, one afternoon it occurred to me to look up Jim Flint. I didn't get to see him, but had a pleasant phone conversation in which I promised to remember him to you when next I saw you. I then thought likely I'd see you up on the lake during the summer. However, what with being away a good bit of July, a vacation at the shore in August, and a lot of company in September, I just never got to it."

"Do try and stop a few minutes sometime when you're on one of those passages to and from New Haven. You will find David able to discuss engineering matters in proper terms and Judith ready to repeat them after him. And Jane will be tired out from trying to restrain the team from putting their engineering ideas into practice. Well, try to find something 'note'-worthy in all this."

Under the benign, if darkly fluttering, wing of Harold Weber, there came into our office on November 14 one Garnett Hartle Porter, who once did a chemical engineering thesis on "Determination of the Tensile Strength of Glues" and who, b'gosh, has stuck to chemical engineering ever since. We asked him to hold up a few

patches of the fabric of his life for your inspection, but he preferred to draw a holy circle around all of life except to say that he is still single; was on his way to visit the Baker Chemical Company in New Jersey; and had been to Weber in search of a good Course X man to design lightning arrester resistance parts for the Pittsfield, Mass., branch of the General Electric Company. No, that wasn't quite all he said, but the lightning arresters in The Review office would resist with one large, potent, blue pencil the other item in his story. Sorry. — F. ALEXANDER MAGOUN, *Secretary*, Room 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1921

We greet 1936 not only for what we hope it may bring to everybody by way of larger shares of the more material things of this world, but particularly because it brings the 15th anniversary of an event in our lives which will be fittingly celebrated this summer, just prior to Alumni Day. Our Fifteenth Reunion Committee is at work on the plans for a week-end, stag party to be spent somewhere on the coast between Boston and New York. Look up those of the Class in your neighborhood and plan your trip together.

D. C. Jackson, Jr., continues to commute between Chicago and Lawrence, Kansas, in order to serve in his dual capacity of director of the Lewis Institute, Chicago, as well as head of the department of electrical engineering of the University of Kansas. In a long, illustrated article published October 2, the *Chicago Daily News* says of Duggy: "A major in the Coast Artillery Reserve, a war veteran who served with distinction on the western front, an electrical engineer of national reputation, an educator who rose from instructor to become head of the department of electrical engineering in a great university, a 1935 model of this peppy electronic age, a man who has reached only his 40th year and who doesn't look a minute over 30, has just taken hold of Lewis Institute as its director."

As usual we start the New Year right — with a memorandum from Professor C. E. Locke, telling us that Professor J. R. Cudworth, director of the School of Mines of the University of Alabama, made a two months' trip during the latter part of last summer through the various mining districts of Oklahoma, Colorado, New Mexico, and Arizona.

Besides his mechanical engineering duties for Lever Brothers Company, 164 Broadway, Cambridge, Albert Alsos finds time for a great deal of community service. From the *Boston Globe*, October 18: "Albert B. Alsos, formerly a captain in the Norwegian Navy and a graduate of the School of Naval Architecture at M.I.T., was appointed to head all Sea Scout activities in Cambridge."

Squander three cents' worth of the New Deal's purple gummed stickers and take time from the steady work of answering presidential straw ballots to send

your secretaries a word that you are still with us! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, Acousticon Division, Dictograph Products Company, Inc., 580 Fifth Avenue, New York, N. Y.

1922

First on the list this month is a letter from Leland K. Cowie, whose present address is 8011 Idaho Avenue, St. Louis, Mo. The letter from Lee reads as follows: "A little over a year ago I was temporarily moved to St. Louis, in charge of the Provident Chemical Works of the Swann Corporation, after having been located down south for a long time. During my sojourn here Mr. Swann sold out to Monsanto Chemical Company and it would seem I am now works manager of the Carondelet Plant of Monsanto Chemical Company. I have been in town a number of times and met some of the other Tech men. Should any of my old friends come through I sincerely hope that they will at least call me."

A letter from John W. Strieder, now very much of a full-fledged M.D. (Harvard Medical) reports that he has opened an office at 471 Bay State Road, Boston, Mass. His official announcement states that his practice is limited to surgery of the chest, to which John has added the following notation in ink: "Otherwise known as thoracic surgery." John spent a considerable period at Trudeau's in the Adirondacks. Lately he has been at the University of Michigan at Ann Arbor. His letter reads in part as follows: "You will not be more surprised than I was to find myself back in Boston engaged in the practice of surgery. I'm sending you an announcement. I've been there now two months and in practice just a few weeks, but so far the results have exceeded my wildest hopes and I'm getting along with a rush. Health good, thank God, and doing everything possible to keep it that way. All that should be an item of news for The Review."

Amos Stevens is another member of our Class who was graduated from the Harvard Medical School. Amos is now located in Fairmont, W. Va., is married, has two children, and is one of the leading lights in the medical profession in that city.

Andrew Langdon is a member of the Rochester delegation of 1922. He is with the General Railway Signal Company. That concern manufactures a great part of the signal systems protecting the railroads and subways of the country. Every time you flash past a semaphore or tear by a green eye in the New York subway, you can think of Andrew and hope that he has done his work accurately. — Ken Sutherland reports from Boston that he is hale and hearty and still in the advertising business. He is a partner in the firm of Sutherland-Abbott, 234 Clarendon Street.

The following members have reported the following changes in their addresses: Clyde A. Benson, from Nyack, N. Y. to York Street, Rumford, Maine; Samuel E. Bickle, from Bath, Maine, to 87 West Buena Vista, Detroit, Mich.; Maurice B.

1922 Continued

Bradley, Devon Hall Hotel, 1588 Ansel Road, Cleveland, Ohio; Charles E. Brokaw, from Sioux Falls, S. D., to Chrysler DeSoto and Plymouth Motor Corporation, 821 W. O. W. Building, Omaha, Neb.; Walter J. Croft, Jr., from West Roxbury, Mass., to International Braid Company, 47 Charles Street, Providence, R. I.; Alexander A. Dedouloff, Apartment 15 A, 227 East 57th Street, New York, N. Y.; Charles J. Dettling, 19 Myrtle Street, Boston, Mass.; William P. Dickerman, from Taunton, Mass., to 130 Newton Terrace, Waterbury, Conn.; Arthur J. Frappier, from New York City to Hotel Margaret, Columbia Heights, Brooklyn, N. Y.; Chester W. Greening, from Palisades Park, N. J., to 222 Christie Street, Leonia, N. J.; Seymour H. Hemenway, from Prospect Park, Pa., to 310 Dartmouth Street, Swarthmore, Pa.; Sanford D. Leland, from Darien, Conn., to Rowayton, Conn.; Lieutenant Colonel Leslie MacDill, 3105 Cathedral Avenue, Washington, D. C.; Isaac Mark, Jr., 59 West 71st Street, New York, N. Y.; Dr. Charles G. Moore, from Mount Vernon, N. Y., to 52 Chatfield Drive, Painesville, Ohio; Paul S. O'Brien, from New York City to Hotel St. George, Room 14016, Brooklyn, N. Y.; Howard J. Roberts, 240 Valentine Lane, Yonkers, N. Y.; Dana D. Sawyer, from Boston to Old Oak Lane, Winchester, Mass.; W. Ryland Scott, 233 Fairmount Road, Ridgewood, N. J.; Milo T. Siverling, Bufllovak Sales Corporation, 2500 Rand Tower, Minneapolis, Minn.; Harold D. Stanley, from Swampscott to 69 Withington Road, Newtonville, Mass.; Thomas F. Williams, from Arlington, Mass., to 21 Myrtle Street, Winchester, Mass.

As these notes reach you, we will be just about starting the New Year of 1936. Our Class has scattered far from Cambridge and a glance at the Register will show that its members are now located in such widely separated points as Rio de Janeiro, Brazil, Wu Hu, China, and Oslo Norway. Wherever you may be, we extend to you the greetings of the season and wishes for a healthy, happy, and prosperous year of 1936. — C. KING CROFTON, *Secretary*, Rochester and Pittsburgh Coal Company, 604 Lincoln-Alliance Bank Building, Rochester, N. Y.

1923

I had a line recently from Jack Keck, X-B, indicating that he is located in Cambridge with the patent department of Dewey and Almy Company. — Jim Brackett, XV, reports his marriage on August 24 to Elsie Mae Foss of Knoxville, Tenn. The couple are living in Boston, where Jim is with the credit department of Sears, Roebuck and Company.

Dr. Per K. Frolich recently left his position as director of the Esso Laboratories to become chief chemist of the Standard Oil Development Company, in Elizabeth, N. J. The Frolich family, of which there are two daughters, one a very new one, has moved into a new home in Westfield, N. J. This new house is a special enthusiasm of its owner. Frolich, son of an architect going so far once as to

register for a course in architecture himself before switching at the last moment to chemistry, thoroughly enjoyed the experience of building a home to suit his own tastes, incorporating many of the newer materials of construction. — HORATIO L. BOND, *Secretary*, 195 Elm Street, Braintree, Mass. JAMES A. PENNY-PACKER, *Assistant Secretary*, Room 661, 11 Broadway, New York, N. Y.

1924

A welcome letter from Bill Robinson heads the news this month, and, reading between the lines, we conclude that a good engineer can also be a good salesman. On a recent trip to Phoenix, Ariz., Bill had an impromptu reunion with Shorty Manning, their first meeting since graduation. Shorty, now assistant chief engineer of the Pontiac Motor Company, was putting one of the "finest cars in the world" (according to Shorty) through its paces over the desert, and did such a good selling job that Bill immediately bought one on his return to Los Angeles. Shorty has been with General Motors since graduation, except for a short period when he operated a lucrative consulting business in Detroit.

Bill also reports seeing Rock Hereford and Phil Herrick in Los Angeles. The former is in the business of finance with the Pacific Company, while the latter, if we may judge from our correspondent, is in the wholesale drug business. To make up a West Coast quartet, Archie Carothers is in San Francisco putting the ice cream division of Borden Company on the map; if we remember Archie, they'd better have a big map ready for him to work on. (Incidentally, we hope that dig will get a letter out of him.)

Bill Correale writes from New York to report that he and Dick Lassiter met in an army camp this summer and that Dick is now an inhabitant of Staten Island. With Bill's letter was a clipping from the *Times* announcing the arrival of a second son in the Ted Simonton household, now in Syracuse, which we imagine must have become the patent center of the country.

From Bob Siskind, professor of electrical engineering at Harvard, we have a card announcing the arrival of Linda Chandler Siskind, six pounds and six ounces, on October 24. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

1926

On Saturday night, November 23, a few members of the Class met in Walker Memorial to discuss plans for our Tenth Reunion. Phil Richardson was selected to be chairman of the reunion committee, Eben Haskell to be in charge of publicity, George Smith and Elton Staples to investigate locations for the reunion, Joe Levis to be in charge of athletic events, and Bob Dean to execute any necessary art work, Bud Wilbur to arrange for transportation, Bill Lowell to be walking delegate and contact man. This preliminary organization will, of course, be enlarged and extended as plans develop.

Phil Richardson is planning to get the above named group together early in January and, at that time, it is expected that fairly definite arrangements will be consummated.

Plans which were discussed at the meeting included: a luncheon at the Institute Saturday noon, June 6; immediate departure thereafter to the scene of the reunion which will continue through Sunday afternoon. This will enable members of the Class who attend the reunion to be present at the Institute on Monday for Alumni Day.

The Secretary bespeaks the coöperation and suggestions of the members of the Class for Phil Richardson and the group working with him. They will welcome ideas and recommendations.

A. E. Benson, who is with the product development department of the Fisk Rubber Corporation at Chicopee published an article in the October issue of *Rubber Age* on "Pneumatic Tires — Design and Construction." This paper was originally presented at the annual fall meeting of the Rhode Island Rubber Club of which *Rubber Age* wrote: "The feature of the business session was a paper delivered by Mr. A. E. Benson, of the Fisk Rubber Company, on 'Pneumatic Tires.' Mr. Benson discussed design and construction, covering the many factors involved in the determination of patterns, heights, and depths. He stated that 'the weather man has more effect on tread wear than anything a tire engineer can do.' He outlined the various steps connected with the eventual selection of a pattern from the crude drawing to the finished product. He also discussed the reasons why 'constructions' are changed from time to time and the steps taken by tire manufacturers to keep abreast of these developments. Mr. Benson injected a little tire history into his paper telling his audience the whys and wherefores of the super-low-pressure balloon tires. In concluding his address he pointed out the importance of continuous research work both in actual road tests as well as in laboratory work."

Richard J. Chapin is with Marshall Field and Company, Chicago. — Richard W. Plummer is in the Argentine with Industrias Químicas Argentinas. — Robert W. Richardson has deserted Maine and is now living on Woodlawn Avenue, Madison, Conn. — John W. Sanborn is with the China Electric Company, Ltd., Shanghai, China. — Charles E. Tonry is with the Cripple Creek Milling Company, Cripple Creek, Colo.

At a recent meeting of the Technology Club of New Hampshire, your Secretary saw Charlie Rich who is office manager of Gregg and Son, Nashua and who was elected a vice-president of the Club. On November 26 at a meeting of the Technology Club of Philadelphia there was a veritable '26 reunion with Gurney Fine, Lee Cummings, Ed Lame, Charlie Petze ('25), and Dick Jones, all present. Gurney is in the chocolate candy business; Lee is with the Sun Oil Company; Ed Lame is getting ready to practice medicine; Charlie is with the duPont Company;

1926 Continued

Dick Jones is an administrative supervisor of Atlantic Refineries. Dick was in Boston recently, studying the Institute's clinic and infirmary to prepare for the establishment of a dispensary for his company. — J. RHYNE KILLIAN, Jr., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

1928

Dick Hoak recently sent us a very amusing letter describing his change from chemical engineer to bacteriologist in the water department, city of Lancaster, Pa. The whole letter is good enough to quote verbatim: "Realizing that the best way of getting one's own horn blown is to be a big wind oneself, I'm jotting down these lines to give you some information about myself which may raise a mere Pennsylvaniac a degree in the eyes of a Masterful Maniac. Necessity being the mother of invention and so on, in March, 1934, I got myself appointed chemist and bacteriologist for the Lancaster Filtration Plant without having more than a vague idea of what bacteriology was all about. However, with my marvelous intellect, I applied myself closely to the business with the result that I can now talk water bacteriology with the best. Amazing? Not when you consider my natural advantages as a Pennsylvaniac.

"To illustrate the heights to which I have risen, I am enclosing a photograph of a cup I won at the convention of the Pennsylvania Water Works Operators' Association at State College this summer with a paper called: 'A Correlation of Differential Tests for the Colon-Aerogenes Group of Bacteria.' This *magnum opus* will be published in the *Journal* of the Pennsylvania Water Works Operators' Association and in *Water Works Engineering*. Note: the cup holds a good two gallons of beer by actual test.

"While I regret the necessity of degrading my profession of chemical engineering by falling to the estate of a mere bacteriologist, I think I can be excused on the grounds of an empty belly. I am sending you this biographical note because I feel that the Class of '28 has not been adequately represented in the 'Awarded' and 'Written' sections of The Review. I would have written my Course Secretary, Gracia, but he appears to be suffering from an acute attack of dry rot, since there has been no Course X news in The Review for many years."

Here's a shining example of a business dominated by a '28 man: Franklin C. McCoy is owner, salesman, and service-man of the Center Radio Company, Newton Centre, Mass., and in addition he's the father of two children, a girl and a boy. — How about a note from you other fellows who are in small businesses. Can anyone beat Frank's record for titles?

It is with great pleasure that we announce the recent marriage of Johnny Kolligian and Miss Madeline Ohanian. The happy event took place on November 10. The class extends its heartiest best wishes and congratulations! — GEORGE I. CHATFIELD, *General Secretary*, 5 Alben Street, Winchester, Mass.

1929

Your Secretary once again takes the opportunity in the January issue of The Review to wish you all a very happy and prosperous New Year with the hope that this is the year we are going to receive that epistle outlining your career since June, 1929. Incidentally, if you had forgotten that you have let another year slip by without crashing this column with the news we have all awaited, now is a good time to give the matter due consideration and resolve to do otherwise in 1936. We all join in assuring you, you, and you that it is with great anticipation that we look forward to your contributions.

Through the medium of an announcement by the proud parents, we have the information that Carlton Wood, VI, and Mrs. Wood have a son, born August 16. — We also learn by letter from Glenn Andrews, X, which we quote at the end of the column, that he and Mrs. Andrews are now blessed with two daughters, the younger of which was born on September 8 and the older is now about two-and-a-half years old.

Various newspaper clippings inform us of the following engagements and marriages of our classmates: Edward S. Hatton's (X) engagement to Miss Clara Louise Grimes of Swampscott, Mass., was announced in August. The engagement of Paul N. Fontaine, IV, to Miss Barbara DeWolf of Malden, Mass., was announced in late October. The marriage of Laurence Horan, IV-A, to Miss Isabel G. Atkinson of Somerville, Mass., took place on July 14. On October 6 it was reported that the marriage of Andrew G. Ogden, IV, to Miss Anne Townsend Vangilder of Morristown, N. J., would take place on October 19. Late in May the engagement of Edward D. Killian, XVI, to Miss Margaret Dunn Killian of Rosindale, Mass., was announced. We join in congratulating our classmates listed above and in wishing them all of the happiness that has been the lot of those of us who have already joined the ranks of the married.

Clippings from London and Boston newspapers tell us that Dr. Nathan Rosen, XIV, collaborated with Professor Einstein on a new theory of atomic particles by which they hope to bring the entire universe within a single hypothesis. Dr. Rosen received his doctor's degree from the M.I.T. in 1932, was a National Research Council Fellow in physics at the University of Michigan in the winter of 1932-1933, and held the same post at Princeton in 1933-1934, when he attracted Einstein's attention. We certainly join in congratulating Dr. Rosen on his thus securing for himself a notable position in the world of science.

We also learn that Herman P. Meissner, X, who, you will remember, is an instructor at the Institute, lectured before the Wakefield, Mass., Chamber of Commerce on the subject of merchandising, in October. — *News-Week* reported the death of Ernesto Samper, IX-B, and it is with great sorrow that we record his

passing. Our classmate was known as the Lindbergh of Colombia in South America and was loved by the people of that country as is the aforementioned famous aviator here. He died in a crash of two transport planes on a field crowded with his admirers and those of a passenger famous and beloved among South Americans.

John M. Way, III, wrote on October 24 from Philipsburg, Mont., and said that for the past six months he has been working for the Montana Water Conservation Board engaged in surveying work. However, in the six years that he has been out of Technology he has had a rather interesting career, involving periods of mining, surveying, managing the development of a small, financially crippled prospect, placer mining, and loafing, all within the confines of the state of Montana. He was in the copper mines of Butte for a couple of years until the depression hit them so badly that he was laid off and had a loafing period for about a year. Placer mining in various locations has been a great help in keeping him busy. At one time he was also rodman and instrument man for the Coast and Geodetic Survey. He had two periods of experience as flotation operator in ore dressing materials. John apparently has gained a raft of experience, but not a whole lot of moss. At last accounts, he was desirous of getting back into the operating end of mining and milling.

The following is an excerpt from a letter Glenn Andrews, X, wrote to Ralph Joep late in October and which Ralph sent in to your Secretary, knowing of its interest to the Class: "After working at Shell's refinery in East Chicago since July 1, 1929, I was transferred to the Wood River refinery in May, 1934. Up to that time Ralph Crosby and I had worked together since graduation. He, by the way, is still at East Chicago.

"At the time we came to Edwardsville, Ill., our family consisted of Mrs. Andrews, a daughter, two years and four months old, and myself. A second daughter was born on September 8 this year. Incidentally, the New England influence is evident in both their names — Priscilla Elisabeth and Katherine Abigail.

"Working for Shell has been very pleasant, and I strongly advise any future graduates not to hesitate to accept any position which this company may offer to them. Of course, since Crosby and I were hired, they have not taken any M.I.T. men, to our knowledge, so maybe we have not set a very encouraging precedent. Occasionally, I come into contact with M.I.T. men, however. Eric Bianchi was here this summer, as Mason Neilan is doing a tremendous volume of business with us just now. E. R. Huckman '26, a rival with the Foxboro Company, is a very regular visitor. We also had a draftsman here by the name of Miller who, I believe, was in the Class of '25. He has recently left to go with Arthur G. McKee in Cleveland. Other than those, my only M.I.T. contacts are through the Alumni Association, although my lack of activity with the St. Louis club is doubtless entirely my own fault.

1929 Continued

"I look back to my years in Boston with much pleasure, and Mrs. Andrews and I definitely plan to make the trip there at the first opportunity." — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

1930

The Class has been in the news recently with the appointment of Jack Jarosh, VI, as varsity swimming coach. On September 8, Jack was married to Miss Elizabeth Mullen of Brookline. — From Baton Rouge comes word of the wedding of Egi Fasce, V, to Miss Sarah Le Blanc on July 3. — Confidential sources furnish us with information concerning the marriage some months ago of Charlie Maskell, IV, to Miss Carrie E. Maxwell of Milton, Mass. We understand Charlie is now working in Washington, D. C. A fellow architect, in the person of Ronald Jameson, took as his March bride Miss Flavilla Smith of Berlin, N. H.

George Cudhea, XVI, who is an engineer at the Naval Aircraft Factory in Philadelphia, was married in June to Miss Marie L. Lopez of that city. Another June bridegroom was George Wadsworth, now an instructor in mathematics at the Institute. George's bride is the former Miss Luella Dudley, who did graduate work in Course V. Now you can understand why we didn't see the two Georges at the reunion. All of you, I am sure, join me in congratulations extended to the above members of the Class. The Secretary must now admit that he is the most recent newlywed of all, for on October 21, he was married to Miss Dorothy A. Lewis of Malden.

Undoubtedly taking courage from the examples set by their classmates, other members of the Class are deserting single blessedness in the near future. Myron Falk, I, and Miss Pauline F. Baerwald of New York are recently engaged, as are Stan Russell, IV, and Miss Martha L. Johnson of Belmont. Shortly before the reunion, the engagement of Miss Geraldine N. Durkee of Salem, Mass., to George Lawson, VI, was announced. George is the factory engineer at the Hygrade Sylvania plant in Salem, Mass. Dave McIntire, VI-A, and Miss Bonnie S. Harding of Dorchester were recently engaged. Al Bird, XIII, was engaged some months ago to Miss Lydia Whittemore of Melrose. From the latest reports, Al is now working in Washington as a naval architect for the Navy Department after an absence of several years from shipbuilding. Welcome back again, Al.

As evidence that our class notes are not entirely devoted to matrimonial affairs, we have gleaned a few bits of information along other lines. Graham Walton, XI, is teaching hydraulics at the University of Wisconsin, while out of the West comes news that Ray Rolin, I, is working with the U. S. Bureau of Reclamation in Denver and Johnny Worcester, XII, is mining in the vicinity of Park City, Utah. One member of the Class has become prominently identified with the Democratic party as economic investigator and adviser to Congressman Shanley of Connec-

ticut. We refer to Dick Staderman, IX-A, who is now in Washington, after several interesting years occupied by graduate work, teaching, and writing.

Jack Latham, II, is back at the Institute for a year of graduate study in Business and Engineering Administration and is also coaching one of the freshman crews up at the boathouse. Jack and his wife are living in Brookline. Another crew man, Fred Twarogowski, II, is becoming a shipbuilder and designer, at the Bethlehem shipyard in Quincy. Hal Spaans is doing yeoman work as Secretary of Course XV, and his fine example is heartily recommended to other course secretaries. While many of us who were at the Five-Year Reunion had a wonderful opportunity to find out what the others in attendance had been doing since graduation, the rest of the Class should account for themselves through their course secretaries for *The Review*. — PARKER H. STARRATT, *General Secretary*, 75 Fenno Street, Wollaston, Mass.

COURSE XV

Marrell wrote a letter the other day mentioning that Harold Plant is working in Pittsburgh for Westinghouse. Hal is married, we understand, and more information is desired about him. Mart was married on September 7 to Miss Mary McGillicuddy of Hingham, Mass. He has knocked about quite a bit since graduation. After being with Westinghouse for two years he was laid off and by the fall of 1933 was appointed an officer in a Maine CCC camp. During 1934 he accepted a position with the Waltham Watch Company which did not "prove in." He writes: "Now I'm in an investment counsel firm in New York City, working as an analyst. We give advice to our clients regarding their investments and I dig out the dope about each company, its history, prospects, position in the industry, securities, and so on. Then we have a conference to decide whether the company, state, or county offers a suitable field for investments."

We are pleased to report the engagement of Johnny Scheuren to Miss Kathryn G. Cudhea of Brighton. — Bob Reynolds has taken an advertising position in New York after spending several years in the engraving business. More details from these boys will be most welcome.

Bob Rypinski came through after an appeal by the Secretary and told of his past five years: "After a year and a half with Westinghouse, in the student course and the advertising department, I left and went to New York to bowl over the advertising agencies. It took me about four months to convince myself that my love for this field was unrequited. I bravely hid my sorrow and went to Europe for a year of study. After about six months in Paris I met the girl who has become my wife. Three months later we were married in London. (Say, Rip, you didn't tell us who she was before you married her!) Following a short honeymoon, we returned to New York, where I worked at various insignificant things for another year. We came out to California in August, 1933,

having decided to spend our declining years in this temperate paradise. I have been engaged in several activities here. At present I am general factotum of the Car Finance Company in Pasadena, which is financing the sales of automobiles for a local agency. Setting up this company has been interesting and instructive, and my Tech experience, particularly book-keeping, has been of real value. We have bought a small home in San Marino, an adjoining town, where we would be happy to see any of the boys whose good fortune it may be to sojourn this way." Thanks, Bob, for your interesting account. Bob's address is 180 West Colorado Street, Pasadena.

Your Secretary is still with Bell Telephone, working out of Harrisburg in the central part of the state. The problem consists of attempting to protect our underground cables from stray direct current. This usually emanates from a trolley system, either surface or mine. Each town presents a different situation to be corrected. As a result, the job is always interesting.

How about some more letters? Course XV hasn't been represented in *The Review* so often as it should. This invitation to write a note or letter does not apply to a specific group. No doubt you have all wondered what has become of a friend of undergraduate days. Let's hear from you to give your pals a line on your activities! — H. R. SPAANS, *Secretary*, 210 Pine Street, Harrisburg, Pa.

1933

A letter from Frank Lopker is my only correspondence this month. Here is part of what Frank had to say: "I have been traveling for something like a year and have only just located here in Los Angeles, where I am working in the engineering department of the Western Pipe and Steel Company of California." Frank also writes that he has heard from Ed Lloyd that he is still single, but has bought a ring. Glad to hear from you again, Frank, and hope there'll be lots more information coming from out on the Pacific Coast now.

As usual the press supplies more information of some of our fellows: D. Malcolm Fleming was married to Miss Muriel Stephens on October 25 in Brooklyn; Quentin Garcia was married to Miss Mary McShane in Brooklyn on October 24; Raymond Brown was married to Miss Viola Picard on October 11. Brown is working with the Ashcroft-Hancock Company in Boston. Edward Loftus was married to Miss Miriam Carr early in October. Here's an announcement which tells of the wedding of our former basketballer, Fred Feustel, to Miss Catherine Hazen on October 26 at White River Junction, Vt; another clipping announces the wedding of Burton Ellis to Miss Amy Clarke on the same date, October 26. John Robins has become engaged to Miss Margaret Notman.

A few other items: H. L. Jewett is working with the Potomac Electric Power Company at Washington, D. C.; Edward Comings is associate professor of

1933 Continued

chemical engineering at North Carolina State College; John Hopkins is employed by Uncle Sam at Vicksburg, Miss., on the government studies for flood control. — Take a few minutes and drop a line to the Secretary. — GEORGE O. HENNING, JR., General Secretary, 163 Barbey Street, Brooklyn, N. Y. ROBERT M. KIMBALL, Assistant Secretary, Room 3-107, M.I.T., Cambridge, Mass.

1934

It is not generally considered good policy for a written article to start out by discouraging its readers, but the fact remains that I can offer little in the way of class news. I have only four letters from which to quote, these having been delivered to me over a period of two months. That, in a way, may explain why I had nothing to say in the December issue of *The Review*. However, let's get on.

According to Brad Ellenwood, who has been keeping in touch with the Course XVII crowd, Dan Lewis (the big man from the South) was married sometime last June. To whom, *quien sabe?* Dan has been busy in Key West, where he has been working on several bridge and construction jobs for the PWA. Vin Rother, after having spent last summer touring Spain, is now studying architecture in London. As for Brad, he is still working along with his Dad. He mentioned an interesting job he did during the last summer in Maine, jacking and shoring a house that had settled eight inches in the center. Columns on which the house rested were in 11 feet of muck and peat, and it required the sinking of caissons through this to hardpan before concrete footings could be set and the house raised.

I might take a moment out to wish Mr. and Mrs. Constant Woodman Chase, Jr., lots of happiness on behalf of all of us. Mrs. Connie, as I think probably all of you would call her, was formerly Frederica Colbath Olsson. The couple were married on July 6, at Balboa Heights, Canal Zone.

I've heard from Goofy Way of Washington, D. C. — the name should bring back immediately the image of a tall fellow who insisted he was from the South and who would try so hard to convince you of this fact that he usually spoke with an affected southern accent. To do him justice, however, I must remind you that he also went by the monica of Gordon Lindsay Way, alias Colonel, alias Goofy, and so on. A bit from a letter of his follows: "My cup has runneth overeth with envyeth evereth sinceth you (meaning yours truly) and Ralph (applying to one Ralph Giel, now imbibing Johnny Walker Black Label to keep away from malaria in far-off Malay) left our fair (but rock-bound) coast for different climes. I even made a half-hearted stab at getting in the mining game myself. I also was all pepped up to come to South America with the rebel forces of a revolution which some American bankers were planning, but for some reason the affair did not come off. I think

somebody tickled the pretender to the local crown with a pigsticker, thus ending the plans until a new leader gets drunk enough to get up and holler about it." Goofy offers some news in his own inimitable way: "... I have heard that Lobdell was recently married to the same girl. ... Herb Plass is hitched and goes to Harvard Medical while Martha studies at Tech. ... Conn is at school doing something. ... Wally Bird just got a job at Passamaquoddy Dam project (hearsay). ... Way was conspicuous by his absence at the class dinner in New York in September, caused by a sore belly brought about by overexposure to the air and a general tightness of the purse strings."

Word came along recently from Bud Pflanz that Ed Chiswell is back at Tech again, this time working for his doctor's degree. Ed had been out California way during the summer, working for an oil company. Charlie Lucke, according to a note from the Alumni Association, prefers to be connected with our Class, and who of us does not want him! Charlie, it appears, although working near his home in Brooklyn, still has a longing for Boston, a longing which carries him back there very often. When can we offer our congratulations, Charlie?

Now for a little bedtime story. Once I owned a car, and I was always proud of the fact that I could cover the distance between New York and Boston in four-and-one-half hours. Well do I remember the thrill I got driving over the fine roads we have in the East. Still, I just can't help remembering the trips I have taken down here in Bolivia, not only by automobile but also on mule back. There is something about one of these trips, especially of the latter kind, that stays with one for a long time. Call it what you will, it still hurts.

What I am trying to convey to you is a sketchy description of transportation in Bolivia. To be sure there are railroads, and one can travel on them in more or less straight lines between La Paz, Oruro, Uyuni, Sucre, Cochabamba, and the borders of Chile, Peru, and the Argentine, but should you care to leave those railroad tracks, you may take your choice of driving, riding a mule, or walking. And that leads to a story.

Roads in Bolivia are what nature made them. On the *alti-plano* between the cordilleras of the Andes, where the terrain is made up of great dried salt lakes, the road likewise is the bed of the salt lake. In the valleys, the only roads to be followed are the river beds. Should you care to cross the mountains in all but a few regions, you had better bring along your pick and shovel gang. The burro, or mule, is able to cross many of these mountains easily because of his sure-footedness, but the poor human, although safe enough riding him, never is quite the same afterwards, though he ride as often as he dares.

However, travel by auto is not much better. Whereas riding a mule usually has its one sore point, traveling by car on these roads tends to make the

whole body weary. Gordon Creveling '25 (mine superintendent here) and I had occasion some months ago to make a trip from Pulacayo, leaving at seven one morning in the company's white car, a 1929 Buick touring car. Besides Creveling and myself, there were the chauffeur and my *alarife* (native rodman and helper). The car was loaded with bedding, equipment, and a food supply for four days.

Our trip first led us down what is called the Pulacayo River to the pampas, or *alti-plano*. The river is nothing more than a tailings stream from the mill and winds its way down a gorge from which steep hills rise on each side. The road, if such it may be called, crosses the stream 24 times over a distance of some nine kilometers, sometimes following the middle of it for a half kilometer at a time. From there the road crosses a desolate, waste land of flat desert inhabited by llamas and vicuñas who feed on the all-too-scarce scrub grass. A shallow, clear river may be seen at a distance, and it is here that the gringos from Pulacayo and Uyuni come to do their hunting for wild geese.

Not far from there, we again encountered tough going, this time dropping to a still lower level through a narrow canyon which appeared almost impassable at first. At the bottom began the valley of a river which eventually led to Atocha. The river, at that time of the year during the dry season, or winter, was nothing but a narrow stream some two to four meters in width. However, the valley it had formed must have been more than 100 meters wide, all gravel, and probably filled to overflowing during the rainy season, which is rapidly bearing down upon us now. At this point, there were low, ranging mountains only in the distance, and this topography lasted all the way into Atocha.

Below Atocha, we followed the valley of the Rio Blanco but in reality it should have been called the Rio de Sangre, because it had taken on a blood-red color from the tailings of a manganese mine which were fed into it some distance above. The narrow stream, very much like the one already mentioned, coursed through canyons that continually ranged in width from some 10 meters to 200. The mountains here varied in height from league to league. It was all very beautiful to behold, but, at the same time, it was tiresome because of the continual and everlasting shaking we received as the car crossed the stream countless times and still maintained a speed high enough to avoid sticking in the soft gravel of the river valley.

It was not until we had come to the junction of the Yura and White Rivers that we saw any humans, and it was not until this same point was reached that we saw any vegetation to speak of. Here, however, we encountered train after train of burros carrying cargos of corn, native wood similar to bamboo, and all sorts of rim-racs that are necessary to the Indians' living. Trees were a welcome sight. (Pulacayo has one tree, an oak growing in the yard of the hospital.)

1934 Continued

Tall eucalyptus, oak, ginger, and pepper trees lined the valley along the wide banks of the river, spreading to the foot of the mountains which rose from them in formations so steep that one can suppose only that the river at one time covered the whole valley and had a terrifically rapid flow. But now it is a small, meandering stream, crisscrossing from side to side in the wide expanse of flat land between the walls enclosing it. Long canals along these walls had been built by the natives at a grade just a bit less steep than that of the flowing stream, which eventually led to the mills that gave power for the grinding of corn and flour.

Still we jounced on. By this time we had stopped for a light lunch of meat and sandwiches that Mrs. Creveling had prepared for us. At six that night we arrived in Cotagaita, a small town just off the river valley, accessible only through a pass between two peaks rising to the left of the valley. Here we inquired about directions and were told that Tocla was still two hours away up yet another river valley, this one, however, being long dried out. Night was already coming over us, but we were anxious to arrive at our destination where we had hopes of finding a bed to sleep in. During the first part of these two hours the road was fair, as the ground had been packed by many passing burro teams (the valley being only some 10 meters wide) but it soon changed into a rocky road over which the car jumped and jounced at little more than 10 kilometers per hour. We all felt extremely glad when we finally arrived at our destination, which turned out to be a few run down houses situated atop a long hill above the rocky valley.

Inquiring of our host what might be in store for us, we were informed that he had not expected us and that there was no food nor any place to sleep. Luckily we were in a warmer section of the land than that in which Pulacayo is located, so we were content to cook our food over a small fire and then make ourselves comfortable on the ground, but not until we had cleared away a mess of rocks that lay everywhere.

The less said the better of the mule-back trip we took the next day, which led us over all sorts of country, through narrow passes, along treacherous crevices and cliffs, and through country infested with pepper trees (whose needles are worse than any others of which I know). At any rate, we were back to our car by three that afternoon, and, having finished our work, we were anxious to start home. In this we made a grave mistake, because, unknown to us, a terrific wind storm was at that moment blowing like fury up the Yura River valley, and it was not until we arrived again at Cotagaita that we found this out.

Well, to make a long story still longer would be useless, so I say simply that the mixture of water from the stream and dust from the air forced us to clean our windshield countless times. Also, in crossing the streams, literally hundreds of times, water was sucked into the

carburetor, each time stalling the car, once in the middle of the stream, all of which forced a halt in our progress until we emptied the troubling carburetor. By eight that night we had covered only 40 kilometers of our return trip, or in the neighborhood of eight kilometers per hour. Shelter that night was afforded by an old, abandoned adobe wall along the side of the mountain, which had been used by some Indians for an open-air kitchen. The next morning our troubles were worse, if possible, because the stream had been frozen solid. Once we got stuck in crossing, forcing us to spend three hours trying to extricate the car by building a stone roadway under each wheel and trying to dam the under water of the stream. We arrived in Pulacayo at seven that night, our feet and bodies frozen, glad that we had warm beds into which to crawl and electric heaters with which to keep warm. — ROBERT C. BECKER, *General Secretary*, Compania Huanchaca de Bolivia, Pulacayo, Bolivia, S. A. HOYT P. STEELE, *Assistant Secretary*, 27 Beechwood Street, Quincy, Mass.

1935

Once again we start on our travels about the United States and this time we have news from another country. First I want to call to your attention the fact that I have moved to Eastport, Maine, and that letters should be addressed to Eastport in the future.

We'll start with some news which should have been in last month's column, but which could not be squeezed into the space. Gary Garaventa wrote me a very interesting letter about a month ago. Here 'tis, lads: "I am employed by the Hamilton Standard Propeller Company in East Hartford, Conn. The plant is only eight miles from my home, so I bought myself a Chevie roadster and drive back and forth. I was at first employed as a helper in the experimental testing department. There we ran all kinds of tests on airplane propellers and the work was extremely interesting, because there was always something new. I did this work for two months and was then promoted to the engineering department. This proved to be a pleasant change, both financially and in desirability. I now have better hours and am doing better work. The plant is connected with the Pratt Whitney Aircraft and Chance Vought Corporation, and Tech men are quite numerous. As a matter of fact, four of my classmates, namely, Sam Fox, Jim Wickham, Bernard Whitman, and Zay Curtis, are employed by Chance Vought and we see each other almost every day. George Williams '30, who was an instructor in the engine courses at Tech is now employed in the design department of Pratt Whitney."

I heard also from Zay and he said that he is receiving a one-year training course and hopes to get into the engineering department afterward. Bill Seary wrote quite a long and interesting letter. Bill, George Bartlett, and Clay Smith are working in the engineering department

of the Naval Aircraft Factory in Philadelphia. The most interesting part of Bill's letter follows: "The high spot of my good luck, however, is the fact that I celebrated the end of four years of servitude by becoming engaged to be married to a very sweet girl, Miss Marjorie Britton, of Haverford and Washington, D. C. It is my earnest hope that my next contribution to The Review will contain an announcement of a wedding." We hope so too, Bill, for your sake, not The Review's.

Now we'll get started on the mass of news which has accumulated during the last month. Running through the courses in order again, there is a bit of news about ye olde civils. There are three of the class here in Eastport working for the soils laboratory of the U. S. Engineers. In addition there are three other Tech men: The chief of the lab is Benjamin K. Hough, Jr., '28, who studied in the soils lab at school a few years back; his first assistant is Reuben Haines '34, who was with us last year getting his master's; the third is Butters, who was in Course I a couple of years ago. Perhaps we will be forming a Tech Club of Eastport, Maine, pretty soon. The soils lab certainly is a fine place to work. It is reported to have the finest equipment in the United States. There seems to be something new to do every minute. Walt Byrne, Frank Muldowney, and I are the members of the Class here. Walt is in the field taking undisturbed samples of soils from a test pit, while Frank and I are busy testing these samples for permeability. Frank has been working on the apparatus for this test for some time and certainly has done a fine job of it. I am waiting for equipment to arrive before I can start the work for which I was employed, namely, research in photoelasticity. In the meantime, I am trying to refresh my memory of soil mechanics, and to help Frank with his permeability tests. The lab is open day and night and some of the tests must be carried on over a 24-hour period. Everyone seems to return evenings once in a while to continue work started during the day. I'll have more to say about the work here after I have become more familiar with it. Walt and Frank say that the only trouble with the place here is that there is very little social life. The fellow who can find a date seems to be somewhat of a wizard.

Course II crashed through this month with letters from five of the fellows. Bob Anderson is working for Bethlehem Steel Company at Sparrows Point, Md. He worked during the summer in the mechanical department office, designing equipment, and is now spending a short period in each department to gain experience. He reports that Lou Baldwin, Bob Landis, and he have been around together several times. Lou is working for the Metropolitan Edison Company in Dover, N. J., and Bob is working for the Harrisburg Steel Company in Harrisburg, Pa. Gerry Feyling dropped me a line some time ago. All has not been a path of roses for Gerry, as he was in the hospital for an appendicitis operation last summer. He

1935 Continued

is working at the rolling mills of the International Nickel Company in Huntington, W. Va. He is not alone there for there are two other Technology graduates in the company as well. Gerry sends out a plea to all the Course II lads to make known their whereabouts through The Review. Let's hear from more of you fellows. Gerry reports that he and Mrs. Feyling had a grand honeymoon through the East and Middle West. They like their present location except for the weather, which seems to have been for stay-at-homes.

Don Gittens wrote quite a lengthy letter; I'll quote parts of it: "After graduation I came home for a week, prior to leaving for O.R.C. camp and I spent the time earnestly looking around New York for a job. I followed leads according to all the rules of the Placement Bureau until I was practically thrown out of several places. Giving that up as a bad job, I went about offering my services to any company that had a likely sounding name. I did this until I finally hit upon the Arma Engineering Company in Brooklyn, N. Y. Here I was fortunate enough to be interviewed by a fellow who turned out to be a Course II man of the Class of '22. Since that also was my Course, we had a lot in common and soon were engaged in a swell bull session about courses, profs, riots, and so on, and I finally emerged with a job. Furthermore, I was told by my prospective employer to go to camp and enjoy myself for two weeks and the job would be waiting for me when I returned. Thus I am at present employed, enjoy my work immensely, and have great hopes for the future with this company. We manufacture exclusively for the Navy a variety of complicated machinery for directing the guns and torpedoes of battleships and submarines. Our machines do all the necessary calculating pertinent to the firing and are entirely automatic in operation. Of course, all the information concerning these machines is strictly confidential and one must be a United States citizen, be finger-printed, investigated, and so on, before going to work. I started as a draftsman to learn some of the business and I have since received a nice raise and have been promoted to the engineering department where I am given lots of opportunity to use all I have learned, and the ol' slide rule is working overtime. Luckily I still have all of my textbooks, which are becoming useful since I found myself in need of a little brushing up on calculus and kinematics. The work is extremely interesting and is providing me with valuable experience.

"Lew Simon writes to me quite often from Detroit, where he is in the design department of General Motors. He seemed to be very lonesome at first but he recently met a 'very gorgeous creature' and she evidently has destroyed every last trace of homesickness in the lad. From what he tells me, he has a soft job, a swell boss, and an apartment of his own. Some fun! — George Glaskaws tells me that he has landed a job within walking distance of his home in South Boston.

Furthermore, the entire staff of the company is composed largely of Tech men and his boss he describes as a grand guy. Course II men seem to have all the luck." Right you are, Don, it does look as though the II fellows have been getting the breaks. Don says that, according to rumor, Paul Germond has quit the Naval Reserve. Probably if Paul flew a plane the way he drove a car, he was asked to resign for the benefit of his instructors and the public in general. Don thinks that Paul is working for his father at present. It seems that Don misses the old grind, for he says that he wishes he were back starting out again as a freshman. A good many of us agree with you, Don.

Phil Johnston has been busy Walter Winchelling. Here's his contribution: Bud Taft is working for duPont in Woodbury, N. J., in the explosives division, running lab tests on dynamite. He expects to be in Wilmington, Del., soon, probably get blown there. Wes Loomis is working for Stowager Electric in Chicago. Art Croxson is working as a metallurgist for Inland Steel. Pete Grant was, at last report, a scoutmaster in Plandome, L. I. Whit Stueck is working in the drafting room of Gibbs and Cox, ship designers. Whit sailed a star load up to Saybrook, Conn., from Brooklyn. Pro Prohaska is working in the gear department of International Motors in New Brunswick, N. J. Pat Patitz and Phil are living together in Elizabeth, N. J. Pat is working for the service department of Foster-Wheeler Company. Phil is now in the design department of Carrier Engineering Corporation and says that he is learning the where's and why's of air conditioning. He says that it makes the Institute studies look like a Sunday school picnic.

This reminds me that it would be a great help if you fellows would give addresses for classmates when you write about them. Another thing, if you want to know where to find anyone, I may be able to help with the latest address. However, I'll shoot anybody who writes for an address without giving a bit of information in return. — Al Creighton is working in the experimental and research department of the Waukesha Motor Company under A. W. Pope, Jr., '18 on development work of the Waukesha Comet Diesel and Hesselman engines.

Turning to Course IV, we have a bit of news from newspaper clippings. First, it is with pleasure that I report that Biss Alderman and Miss Mary Compton, daughter of President Compton, were married, November 16, at the Compton's home. They will make their home in Reading, Pa., where Biss is employed by the Metropolitan Edison Company. Many years of happiness to you both. Second, we have another wedding announcement. In the last issue I reported the engagement of Sam Paul and Miss Gladys Bluestein; they were married on September 22. Good luck to you both. It seems as though the architects are the matrimonially inclined members of our Class.

Course V is holding its own also in the letter-writing game. Bill Barker, it seems, waited until I made a mistake in reporting him before writing. Looks as though I'll have to make a lot of mistakes in order to get a few more letters. Bill, contrary to my last report, is working across the bay from San Francisco for the Oleum refinery of Union Oil Company. He reports that Cornelius Wilson has been transferred to Avila, Calif., about 250 miles down the coast. They have both been in the inspection laboratories receiving control tests on oils, gasoline, and asphalts. Bill says that he has found out that "asphalt is dirty and gasolines and oils are greasy." However, he has hopes of learning more. He warns me about letting people rave about the California climate, for it was 26° there when he wrote the letter, November 5. Dud Williams is doing graduate work at Brown University and is acting as an assistant in the department of chemistry. He guides juniors through their physical chemistry lab.

And now, gang, we have that long-awaited letter from England. I know you would all like to have it verbatim, so here it is: "I just got the October Review about half an hour ago, and the stimulus was so great that I couldn't resist the temptation to write a letter (remarkable). It certainly does people good to hear the news when they're 3,000 miles away; let me tell you! Not that I'm not having a swell time here

"I'm doing research here in the Jesus College labs, for the Oxford degree of B.Sc. (Bachelor of science), which corresponds to an American master's. My subject is entitled 'Studies of the Catalysis of the Gaseous Reaction between Hydrogen and Oxygen by Palladium, Platinum, and Iridium.' It involves a lot of glass blowing and building of those mazes of glass tubing that you can see in parts of Building 6. So far I'm lousy at it, but I ought to have it all built by Christmas vacation (which starts on December 6 and goes for six weeks!), after which I'll start running experiments.

"The whole system here is so entirely different that it would take a long time to explain — more time than I have right now. There are no separate classes — just a few exams between the student and his degree. But what exams! Actually, the lectures, tutoring, and lab instruction don't amount to much in most cases — just the fact that the requirements are tough and that a fellow knows it and gets the stuff by himself. That's how they spend those wonderful, long vacations — brown bagging! Then after vacation ends, they have a little exam known as 'collections' to see what they've learned during vacation! I'm taking in as many as I can. One series in particular, on wave mechanics, by Schroinger, the famous German-Jewish physicist, is good.

"In summing up, I'd say that a fellow who takes the Honors degree in chem here — he gets both B.A. and B.Sc. in so doing — knows a lot more chemistry (pure chem) than an average American M.S., but less practical applications, and far

1935 Continued

less about subjects not in the specific field of chemistry. Chemists are not plagued by economics or history — they're supposed to know those from school.

"What else? I'm rowing! Jesus College rates about 11th, out of the 24 or so eights on the river — and they may (?) stay there, with me in the boat. Right now they've got just one eight out and I'm in it — at Number 4. There are four novices and four 'good' men in the old tub, which, in the words of the coach, 'careens down the river like a mutilated crab.' These Welshmen! (Jesus College is 40% Welsh.)

"We get up at 7:30, to make a 7:45 roll call. Lectures and lab, from nine to one. After lunch, rowing. Lab from five to seven and again after dinner if desired — else, study. We positively must be in college by midnight, and 'gating' fines begin if we come in later than 9:00 at any time. The dearth of female companionship is appalling — although I did entertain a Wellesley gal, who's staying in London, the other day. There are two other Wellesleyites in London, too, whom I know, but the town's 80 miles away! So I write lots of letters and contemplate the day when I can throw off this monastic garb.

"I'm rooming with another American, Bill Franta, a Rhodes man from North Dakota. That's some comfort. We get along well and save in lots of the expenses by sharing things. You can wear anything at all here and nobody cares — but you must wear your gown (the hell with the cap, though the rules say so) at dinner, at roll call, and when calling on college officials. The English food is digestible to some extent — I can't say much else for it. (Secretary's note: Perhaps Stocky longs for those delectable delicacies obtained in Walker.) The weather — cold and damp, as advertised. The women, by sight only, fair enough. There are 800 Oxford undergraduates, some of whom I ought to meet before my two years are up. I have a piano in my room (Secretary's note: I'll bet they haven't heard such fine playing in quite a while.) and that helps keep up the old cheer, 'between the hours of one to five p.m. and seven to eight p.m. and at no other time.' (So say the rules!)

"We had a fine trip over, there being 28 Rhodes Scholars in the bunch. We spent a week in London before getting up here, during which we acted like sight-seeing tourists, and went to American movies. To conclude, I'm thoroughly enjoying myself, and can only wonder how best to spend my time, there are so many inviting and valuable things to do here. I haven't said more than a few mouthfuls. Give my regards to the '35 men you see or write to — and if ever any of them have occasion to visit this country, their names are mud if they don't look me up. Keep that column buzzing, for me if for nobody else."

How about it, gang? Each one of you write your latest escapades every month and we'll keep Stocky supplied with news. I guess he will have plenty to keep him out of mischief.

"The wheel of fortune spins" and this time it stops at the door of Course VI. Rumor has it that Bud Pflanz and Frank Trifari are not having any dates with Lady Luck. Here's hoping that by this time they have been introduced to the gal. Al Mowatt has fared a bit better. Al has left the Bahama Islands to take a job with the West India Chemical, Ltd., and will be "in the gravy" soon. He reports that Don Wood married Miss Felicia Townsend of Melrose on the 7th of October. Congratulations, Don. Al missed the wedding because he was in the hospital having his appendix removed. He says that Henry Kimball is with the United Shoe Machinery Corporation; James Libby is back at school for graduate work; Jim Parker is at Schenectady in the electrical coöperative course; Freeman Hudson is with Colgate-Palmolive Peet and Company at Jersey City; Dick Smith is in Boston in insurance.

Al had a swell trip last summer; here's his version of it: "I had a break of luck last June right after graduation. I played with the M.I.T. Aristocrats who played on the *Aquitania* over to France and back, for which we got one passage free. We had three weeks over there and saw plenty of Paris as well as Belgium and Northern France on bicycle. On return I worked in Sandwich, N. H., doing everything from haying to carpentering, painting, and setting up a sawmill. In between I made a dash up Mount Washington via Tuckerman's Ravine in one hour and 32 minutes — third fastest time recorded! Then came this hospital trip and now the South Seas!"

Vin Ulrich seems to be as busy as a one-armed paperhanger with the jitters; here's his story: "My job around here (Secretary's note: *Radio Today*, business magazine of the electronics industries) at this time of the month corresponds to that of managing editor of the *T.E.N.* I am handling all the publication details. Then on top of that I'm technical editor. I'm the only one around here who has a theoretical understanding of what radio is all about — so it's up to me to see that everything is technically correct — even though most of our material is presented from the business angle. A large part of the month I'm out around contacting the big shots in the industry and I do some reporting. I manage to ring in for parties, dinners, and so on. Had a talk with Professor C. E. Tucker's secretary and learned that 28 out of the 40 electrical engineers have been placed in some sort of a job, in one or two instances, temporary connections. Beverly Dudley is with R.C.A. Radiotron Company, in Camden. L. V. Baldwin is with Metropolitan Edison Company, in Reading, Pa."

I had a letter from Otto Zwanig, who is at school doing graduate work. He had quite a bit of information about class members: "Charlie Debes is at home in Chicago and when last heard from was working as a pipe fitter, not the kind that fits pipes, but the kind that takes fittings down. Ed Helwith is continuing his study at Columbia, pursuing no course of study for an advanced degree but merely

taking those courses in which he is interested — such as mathematics. He has his tuition paid by the school and in addition is being paid for correcting papers in a course. Paul Herkart is still at home in South Orange looking for employment, but is hoping to obtain same soon in the operating department of Public Service Company of New Jersey. John Mooring likewise is at home without any permanent employment. At present he is doing some temporary work for Mr. O. Eschbach of the Bell Telephone Company in New York City. Clark Nichols started working for Leeds and Northrup Company in Philadelphia toward the latter part of September. Bill Keefe, one of the two electrical students selected by General Electrical Company, reported to its Schenectady plant on October 14. He is now in the test department of that company. Rufus Applegarth, Julian Bigelow, Cope MacAllister, Vincent Mooney, Charlie Piper, Perry Ware, and yours truly are now at the Institute engaged in graduate work." Otto's father died in October. The Class joins in expressing its sympathy, Otto.

Ralph Woolf is the only loyal son of Course VII (?) to write, but what a letter: "It happens that now I am indulging in the task of pursuing the degree of doctor of medicine at the University of Rochester, having the honor of being the only student from Tech who is enrolled here, and if I manage to complete the course, as I hope I shall, I will be the first alumnus to graduate from this institution. From all indications, I am embarking on a most interesting and enjoyable career, but, as no doubt you know, there is considerable work entailed with the obtaining of a position in the medical profession, and I haven't any intention of being caught stealing second base, because there is a high mortality of first-year students here. Directly after the senior formal I entrained for New York City to become bacteriologist for the New York Eskimo Pie Corporation and pursuing the duties as an employee of said company consumed my time up to Labor Day, when I left for Boston for a week's vacation previous to leaving for Rochester. With me at New York Eskimo Pie Corporation were Murray Avery and Lennie Stoloff '36. The three of us spent a most enjoyable summer working as control chemists and bacteriologists. Eddie Friedman completed the foursome in New York City and he was employed by the Swartz Laboratories, well-known consultants for the brewing industry. Unfortunately his stay in New York City was cut short by an opening in the Old Brockton Wine Cellars, Inc., of Brockton, N. Y., as chief chemist in charge of research. As for my Tech activities in Rochester, I happened quite by chance upon George Valley, who is employed by Bausch and Lomb Optical Company here, and through the medium of George, whom I see almost every week, I learned of the frequent visits of Walter Wallin. Walt works for the Spencer Lens Company in Buffalo and he comes to Rochester to attend various musical performances on Friday evenings."

1935 Continued

Tom Blair completed his requirements and will receive his degree in January. He is working for Automatic Electric Company in Chicago, on measuring equipment, and is taking an electrical engineering course at Armour Institute in order to tie up some of his theory with practice.

Coming to Course IX we have an announcement to make. The arrival of Charles Ebert Slade, 3d, has been announced by his parents, Mr. and Mrs. Charles E. Slade, Jr. — Pat Patitz sent me a letter a short time ago with information about himself. He is living with Phil Johnston and is working in the Carteret, N. J., works of the Foster-Wheeler Corporation. This seems to be all the accurate dope on the Course, but rumor has it that Pete Grant has taken charge of equipment in his father's plant, and that Bud Taft is somewhere in Delaware working for duPont. How about letters confirming this, Pete and Bud?

Warren Sundstrom was at the Buffalo Station of the School of Chemical Engineering Practice, having been to the Bangor and Boston stations. He will be back at Tech by the time you fellows read this column. He expects to get his M.S. in June. Jack Flaitz is living in Houston, Texas, and is working for the United Gas System. The work deals with the sale of natural gas to industrial plants, and the department in which he works handles all the problems on fuels, combustion, and matters pertaining to industrial plant operation. He says that there are several Tech men in the organization.

Coming to Course XII, I have a newspaper item which adds to the information already mentioned in connection with Don Wood's recent marriage. Art Haskins was one of the ushers at the affair. Mr. and Mrs. Wood will be in New York by this time, where Don is working for the Eastern Steamship Company. Art dropped me a line recently reporting on some of the Class. He says that John Newell is working in the Fore River Plant of the Bethlehem Shipbuilding Corporation. John is an assistant foreman in the pipe shop which installs the piping on the naval vessels in the yard. Herb Solibakke is working in the Newport News Shipbuilding and Dry Dock Company doing technical work. He has been spending most of his time making up tables of tank capacities for the airplane carriers, but has done some design work also, including lines, accommodation plans, structural layout, bulkhead placing, powering, strength calculations, curves of form, and so on.

Here is John Rutledge's account of his doings: "As you doubtless know, I spent two years in Course XIII and one in XIII-C while at the Institute. At the end of this period, that is in June, 1934, I had a chance to ship out on a steamer carrying freight to the West Indies. I did not take it, however, as a very much better opportunity presented itself. I received and accepted an offer from the International Grenfell Association to go down to Labrador as supercargo and assistant to the executive officer. I was to be placed on vessels owned or chartered by the or-

ganization at his discretion and I was to further the proper assembling and distribution of general cargo, mainly along northern Newfoundland and Labrador. After spending a couple of weeks in the New York office helping to assemble general cargo, looking after proper stowage when we loaded at the end of this time, and 'getting the hang of things,' we set sail in an old Norwegian tramp with about 1,000 tons of general cargo, including everything 'from a needle to an anchor,' as they say. In a week's time we arrived at St. Anthony and discharged. Three days after, I was transferred to the cargo schooner, *George B. Cluett*. My duties aboard her were somewhat similar to those of a third mate. I had to tally cargo and be generally responsible for it. The summer was crammed full of adventures which, if I attempted to relate, would fill a book. I was even shipwrecked one night when a power life boat we were going out in ran on a reef in the black of night and thick fog, and threw all of us into the water. On September 13, 1934, I arrived at Portland, Maine, and, in a hasty trip to New York, finished my duties as supercargo, after which I again joined the vessel, as the 'Old Man' had given me a chance to ship before the mast for the fall. The crew was out to a minimum and I was told that 'it was no joke goin' down North in the fall of the year'; the more reason I wanted to go. The next three months, in spite of the hardship and hard work, seemed like a vacation to me, for I no longer had to worry about all the responsibility. In December I arrived home and, though feeling fine physically, was somewhat perturbed in mind as to my next move. I had a chance to go South again as seaman, but saw no future in it.

It was my idea that while I was out I would find some field of particular interest to me, get some practical experience in it, and then if I saw the benefits for further study at the Institute, I would come back and make the most of it. About February 1, 1935, I signed up with the United States Diesel School. I became very much interested in Diesels and enjoyed the work and study very much there. In June, after 4 months there, I again went North for the summer in the same capacity as I did the previous summer. However, for the last two weeks I came home from Labrador in the Diesel yacht, *Maraval*, as second engineer. She is about as nice a little motor sailer as ever I want to be in, but she is only about 78 feet overall, and that's not very large to be knocking around the high seas in dirty weather, as far as comfort goes. The *Cluett* is about 145 feet overall and that's plenty small enough in the fall of the year. At present I am back at the Diesel School and expect to graduate in about two months, instead of four. After completing this study, I plan to get some practical experience — in manufacturing — if possible, with the help of the school. My returning to the Institute will probably depend upon the outcome of such work." Quite an exciting life it seems. I'll bet John can tell us some rare old yarns at reunions.

Turning to the pencil pushers (executives to you), we have a rumor that Dick Shaw and Gregg Fry are working for Travelers Insurance in Hartford, Conn. Week-ends find John Duff in Philadelphia with Hal Bemis and Charlie Taylor, but I can give no further information about the latter two. Duff, by the way, is rapidly gaining a wealth of experience meddling in expense sheets besides heavy acids at the plant of General Chemical Company. He has been stationed in New York, Baltimore, and Wilmington, Del. Dave Buckwalter is working for the United States Rubber Company in Naugatuck, Conn. He has a three months' training period to complete before starting to work in the planning department. After graduation, Dave went to work in a woolen mill up in the wilds of Maine, but left because of the poor prospects for the future.

The record so far for distance in letters is taken by Bob Grosjean. Here is a part of his letter from Brussels, Belgium: "Haven't done much in the way of actual work since graduation; a trip to Switzerland and some mountain climbing took up a good part of the summer; after that I worked in the offices of the Brussels exhibition (which really proved quite a success) until it closed its doors a few weeks ago (Secretary's Note: letter dated November 2). Have just landed myself a job as private secretary and assistant to the President of the Belgian Senate — nothing political, just making analyses of various companies in which he is interested and presenting them to him in abbreviated form. Right down the main alley of Course XV. Really very interesting work and far from monotonous, as everyday (thus far) something new seems to pop up, which, after all, is quite understandable, as the boss is interested in about every kind of industry in the country. The only drawback is that this job takes me a bit far from the States and the contacts established there during my college years. People can say what they want but that country of yours is a fine place to live in, and if I were lucky enough to be there, I don't think that I would ever leave again. Over on your side you may have Huey Long (Editor's Note: We'll have to inform Bob), New Deals, and so on, but at least you belong to yourself and don't face the risk of being called to arms and get lead in your pants for a cause you don't care much about. The Italo-Ethiopian situation gave us quite a scare a few weeks ago, but now things seem to have calmed down, and the general feeling seems to be to let Italy follow its projects (even if sanctions are voted on all sides). By the way, I went away for a couple of weeks of military camp right after I got back." We hope to hear from Bob often, as he can give us some good information about things over on the other side of the big pond.

Bob Forster is located in York, Pa., working for the York Ice Machinery Corporation. He started to work the first of July and is at present engaged in learning the business of air conditioning and

1935 Continued

after that he is scheduled to return to Brooklyn and take up work there as a sales engineer. Bob likes the work so far, and expects to go far. Don Morrison is working for the same company and taking time studies. — Mel Farquhar is working for the McKay tire chain company in New York. Dick Hughes is working at Dun and Bradstreet in New York. Bob Kennedy is working for Union Carbide and Carbon in the Big City, and Buckley Crist is with Calco Chemical at Bound Brook, N. J. Jack Orchard thinks that school is the place and is taking a law course at Harvard. Gerry Golden is in New York City working as purchasing agent or production manager, as need may dictate, for the General Accessories Company. Jimmy Glenn, Vin Ulrich, Walt Daley, and Gerry have an apartment together. Jimmy is doing development work for the Color Instrument Corporation and Walt is managing the machinery department of Patterson Brothers, a hardware outfit. Bart Chapmen is working for the duPont Company at the Remington Arms Company in Bridgeport,

Conn. Dick Lawrence is working for an automobile service station supply company in Boston. Jack Burton, Art Gilbert, and Ed Dougherty have decided to become business men at the Harvard Business School, inasmuch as there is little doing in the executive line in engineering. They have quite a Tech group there now, for Jack Orchard, as mentioned above, is in the Law School and Joe Seligman '34 is in the Business School.

We'll close with a bit of news about the carpenters. Ned Collins, that old politician, dropped me a line with some news of the gang. Ned is enrolled in the city planning course in Rogers and is competing with the artichokes, pardon me, I mean architects. He says: "I find the work mighty interesting and I believe I will be able to overcome the hurdle of jumping into competition with embryo architects on their home grounds. It is, therefore, unduly complex, but I really feel that I have something of the architect (God knows what!) about me, and it will come out." Well I guess there is little doubt about Ned licking the archi-

tects on their home grounds. He'll probably organize an architect's club so that they can elect him president of it. Vin Cook, I hear, has finished his work with Burtis Brown of Boston; what he is doing I don't know. Max (Whataman) Wasserman is busy as the bees handling his father's business and will have his first million salted away shortly. Bill Klehm also is working for his father, as Jack-of-all-trades. He is learning the plastering game from the ground, or should I say lath, up. Howard Staley is having his troubles as a research assistant in Professor Voss' lab. He is taking a number of subjects and hopes to get his master's in a couple of years. Larry Hall is still busy building our country's Canal on Cape Cod.

Let's go, gang, on the letters — you can't send too many in for this column. Please note the new address and don't forget that Jack Hossfeld is in this game now. — ROBERT J. GRANBERG, *General Secretary*, 172 Water Street, Eastport, Maine. JOHN D. HOSSFELD, *Assistant Secretary*, 23 Hale Street, Beverly, Mass.



AN ETCHING OF M. I. T.

By Louis Conrad Rosenberg

PUBLISHED BY THE TECHNOLOGY REVIEW

MR. ROSENBERG, one of the few great American etchers, and a graduate of M.I.T. ('13), has executed a plate of the Institute's Main Group of Buildings that admirably exemplifies his supremacy as an etcher of significant architectural form. . . . Only a few of the one hundred and seventy-five prints that were pulled before the plate was destroyed, are now available at \$35.00 each. . . . The size of the etching is 13" x 8" and each print is mounted with a mat, size 22" x 16½", ready for framing. Each print is signed by Mr. Rosenberg.

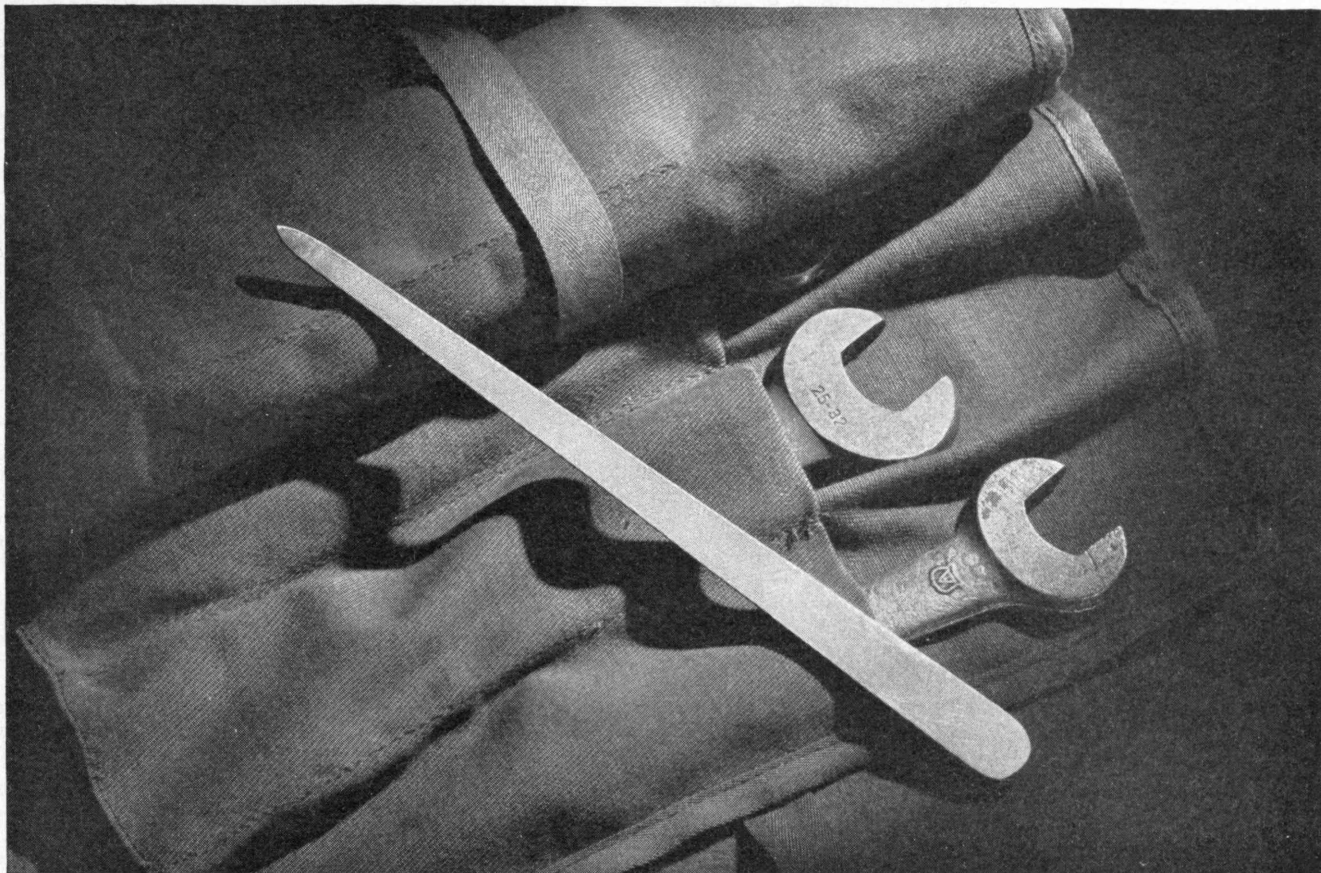
TWO INSTALLMENT PLANS OF PURCHASE

If desired, an etching may be purchased on the installment plan, \$16.00 with order and two monthly payments of \$10.00 each; or if you prefer \$6.00 with order and six monthly payments of \$5.00 each. The etching will be shipped upon receipt of the first installment.

DELIVERY BY RETURN MAIL

Address inquiries or orders to THE TECHNOLOGY REVIEW, Room 11-203, M.I.T.
CAMBRIDGE, MASSACHUSETTS





THE PASSING OF THE NAIL FILE

TWENTY YEARS AGO, the wise car driver carried a nail file to clean the platinum points in the distributor.

Today, the nail file is banished from the automobile tool kit. Tungsten points, developed in the General Electric Research Laboratory, in Schenectady, N. Y., have replaced soft and expensive platinum. There is little need to file tungsten points. Hidden away, requiring no attention, they break electric circuits half a million times an hour and save car owners millions of dollars a year.

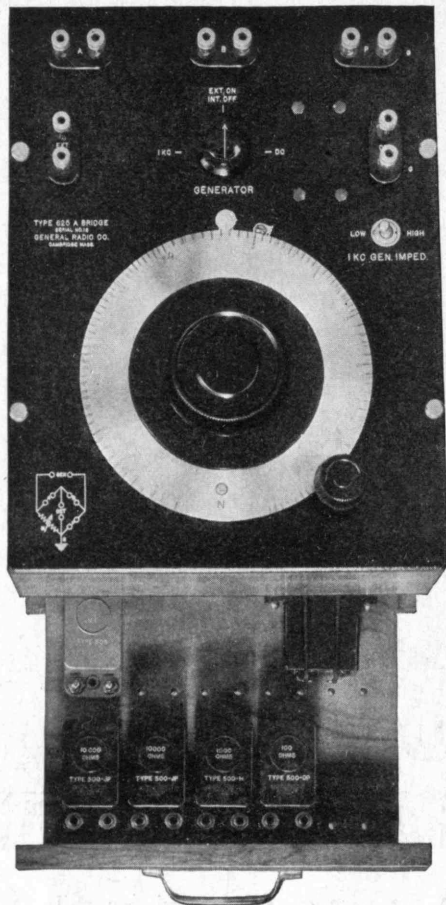
Is this all G-E research has done for 24 million car owners? No! It has given new welding methods—and a stronger and safer car at lower cost; Glyptal finishes—and the expense of repainting your car is postponed for years; headlights and highway lighting—night driving becomes safer for motorist and pedestrian.

Every product that carries the G-E name has built into it the results of G-E research. Other industries—and the public that buys the goods of those industries—have benefited by this research, that has saved the American people from ten to one hundred dollars for every dollar it has earned for General Electric.

96-186DH

GENERAL  **ELECTRIC**

FOR THE RAPID MEASUREMENT OF **INDUCTANCE RESISTANCE CAPACITANCE**



**An Inexpensive
General-Purpose Bridge**

THE GENERAL RADIO TYPE 625-A BRIDGE

is a skeleton bridge designed for use with *your own* standards. It can be adapted to a wide variety of circuits. If set up to measure any one of the three circuit elements,

accurate measurements may be carried through by anyone.

One arm of the bridge contains a 10,000-ohm direct-reading logarithmic rheostat, giving constant fractional accuracy of reading. The other three arms are brought out to pairs of terminals on the panel.

A 1,000-cycle a-c voltage source of good waveform is incorporated in the instrument.

With suitable standards, an accuracy of 2% may be obtained over a considerable portion of the following ranges: inductance: 1 microhenry to 100 henrys; resistance: 1 milliohm to 1 megohm; capacitance: 1 micromicrofarad to 100 microfarads.

A versatile instrument, adaptable to a wide range of measurements, and permitting accurate results with your own standards, **the Type 625-A Bridge is priced at only \$65.00.**

Write for Circular P-85-T for complete details

GENERAL RADIO COMPANY
Cambridge, Massachusetts